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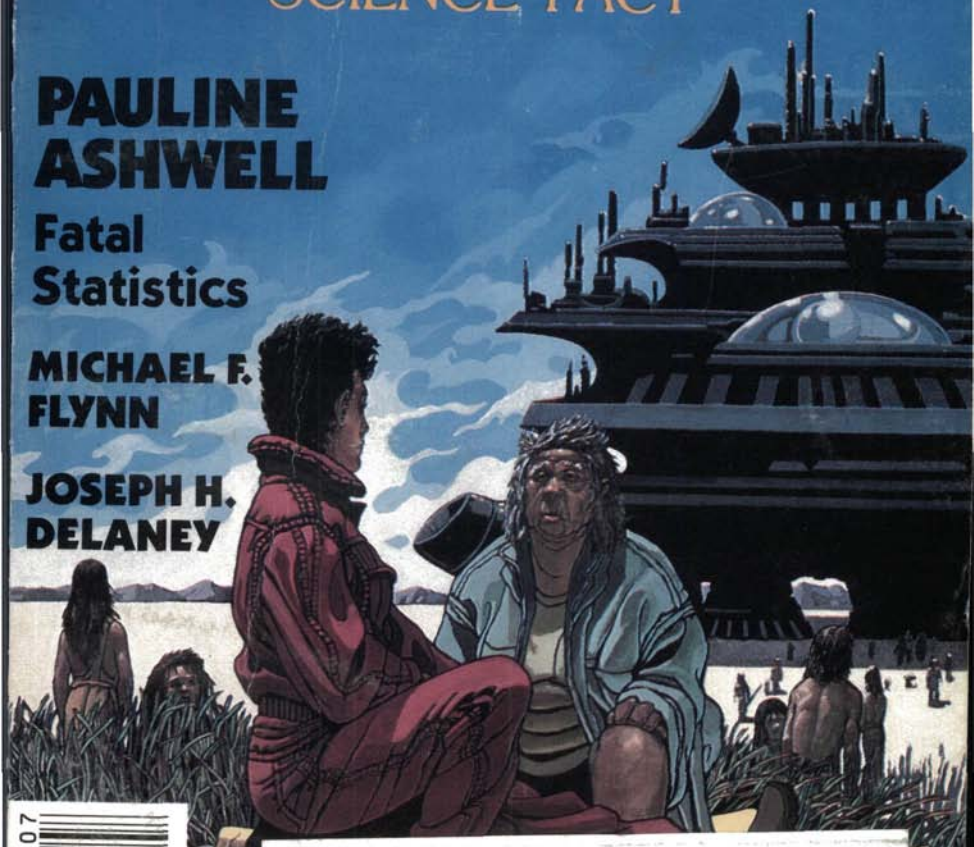

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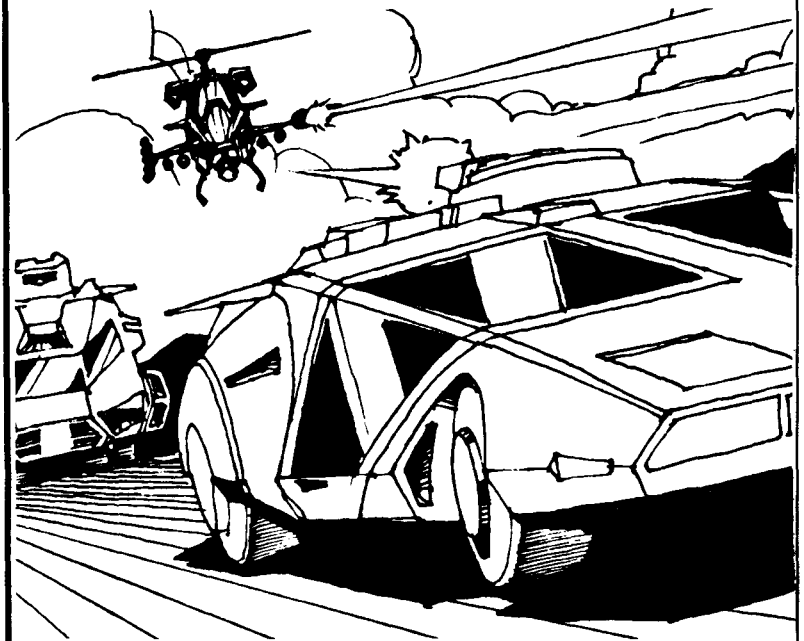

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Editorial

A REQUIEM FOR SUMMER?

Stanley Schmidt

You'll be reading this about when school is letting out for the summer—if that's still done where you live. Probably it will be, at that point—but there's some doubt about how much longer that will be true. As I write this, I have in front of me a clipping about the adoption of a 12-month school year in Los Angeles and the interest of many New York State officials in doing something similar here. They think this is Progress. But is it really?

People have been talking about the idea of year-round school for decades, but until now have seldom, if ever, done anything about it. A phrase always prominently invoked by its advocates is "cost-effective," and this article is no exception. There are also lines about its being "beneficial not to have to shut down school at an artificial time every year," and the possibility of offering more courses and more time for staff development. To be fair, the article also mentions likely sources of opposition to the idea, including summer camp owners, teachers' unions, the tourist industries, parents who work away from home, and parents who would like to spend vacation time with their children. (The children themselves, not surprisingly, are not mentioned.)

My own first reaction is to remember, from my own days as both student and teacher, what a welcome—perhaps even

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necessary—relief summer vacation always was. Doing that, I cannot help sympathizing with students who may soon be deprived of that change of pace, and wondering what total effect such deprivation will have on them. It seems to me that summer vacations were quite clearly *good* for me, in a way different from and complementary to any benefits school might have had, and that's probably true for others, too. I don't, of course, expect such a claim to make much impression on people who evaluate everything solely or primarily in terms of cost-effectiveness. So even though I consider intangible benefits of vacations *per se* one of the strongest arguments in favor of them, I suppose I must digress for a while to comment on the *educational* value of summers away from the classroom.

To put it bluntly but honestly, with very few exceptions until I reached college, vacations were a more important part of my education than school was. I'm not just referring to the light that travel can shed on subjects like history and geography, though I have found that no amount of reading about a place teaches about it half as effectively as going there and experiencing it. When I was growing up, I had relatively few opportunities for extensive travel, though the ones I did have were memorable and valuable. But even when I wasn't traveling, summers were the one time that gave me the chance to do much exploration of subjects *beyond* what was covered in school. Most of what I had in school I found limited in scope, unchallenging, and uninspiring. But in the summer I could read widely, exploring encyclopedias, and libraries, and magazines like *National Geographic* and *Scientific American*, discovering and learning about subjects as diverse as radio astronomy, scuba diving, orchestration, linguistics, the design and uses of particle accelerators, parts of ancient history my classes never touched on, and on and on and *on*. Summers were when I had time to try my hand at writing science fiction and music, or repairing bicycles and radios and television sets. Summers were the time when, far more than in school, I could explore the options that exist in this fascinating universe, to learn where my interests and abilities lay and where they might lead. Above all, they were when I taught myself to teach myself—which, in the long run, is a more important and powerful ability than any single skill which is taught in school.

You may object that the schools should have been doing for me much of what I was doing for myself. Maybe they should have been (though that last item, by its very nature, would still have required independent practice), but they didn't do it very well. I suppose they *tried;* but they necessarily pitched pretty much the same curriculum at everybody, at a pretty much standardized rate that was frustrating for both the slow and the fast. The formal curriculum (mostly) looked thin and pallid compared to what I found in my own explorations. I *needed* time to go off on my own and find what interested me most, and find my own ways of doing the most I could with it. I think that

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would remain true even if the schools had been vastly more effective—and I've seen little evidence that they have since become so.

You might also object that most students won't use vacation time the way I did. No doubt many don't—but society especially needs the contributions of the ones who do. Creative, self-motivated people tend to work that way. A steady diet of *either* completely guided and structured or completely unguided and unstructured education is unlikely to do much for them. Even if many students will not take the opportunity for self-education, it needs to be there for those who will. And more will than you might think, given suitable encouragement such as that provided by good interactive personal computer programs. (An idea, by the way, which I anticipated in a story written during summer va-

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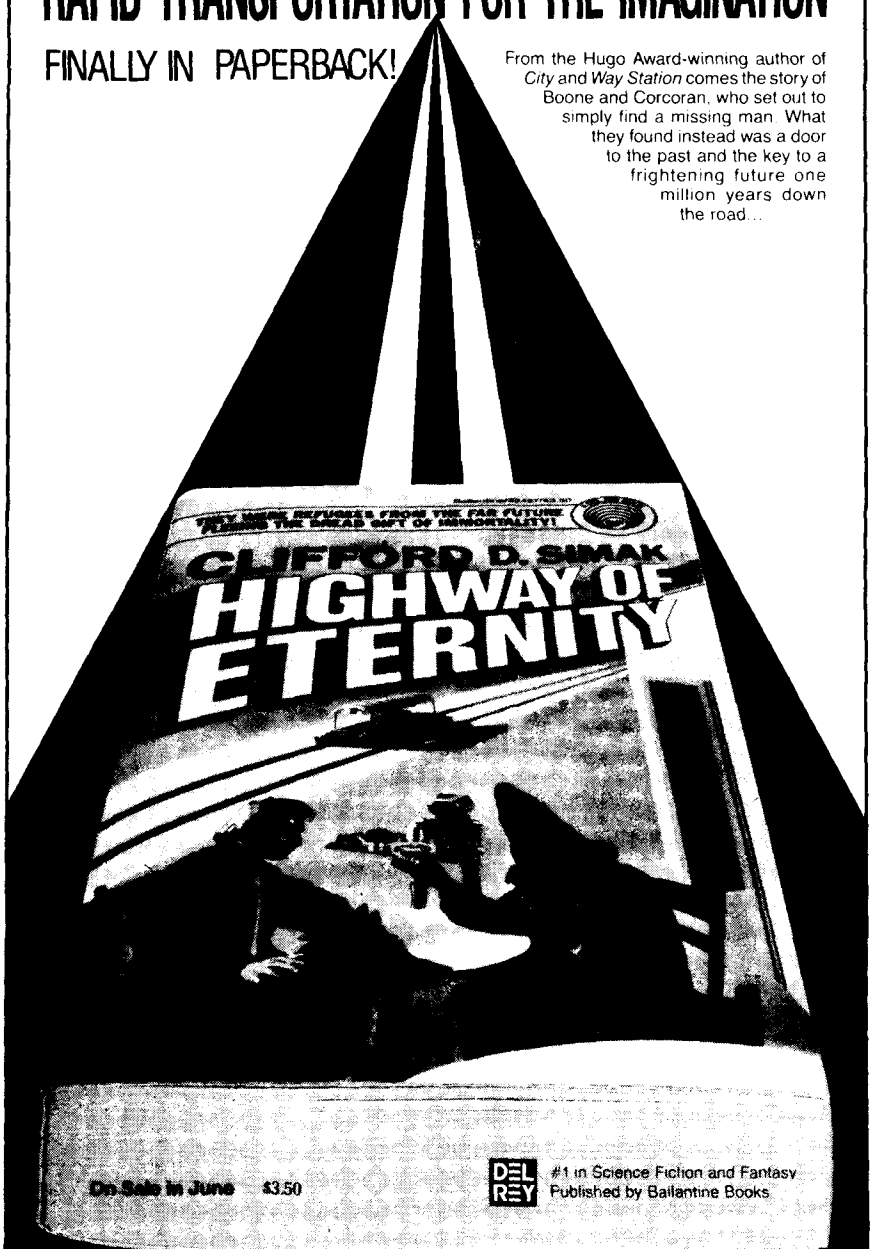

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cation between the eighth and ninth grades.)

There is certainly a place for the kind of education that goes on (or should go on) in schools. I've done it; I took the job seriously, tried very hard to do it well, and enjoyed some gratifying successes. But there is also an important place for kinds of education that *can't* be done in schools, and time needs to be allowed for those, too.

Even the part that needs to be done in school is worthwhile only if it's done well. One official was quoted in the article I mentioned as saying that certain school districts are prime candidates for a lengthened school day or year or both because they're presently producing substandard results. Does he really believe that "more of the same" is the answer to that problem? If those schools are failing to teach their students in the same time that works better elsewhere, they need to find better methods—not just spend more time applying the ones that already aren't working.

But educational methodology is not the only issue in the question of summer vacations. Vacations can have educational value, but that is by no means the only value they have. I certainly didn't spend *all* my free time studying or creating, and I'm a firm believer in the virtues of lying on a beach or taking long walks with neither destination nor timetable. The term "recreation" is made from pieces clearly suggesting its *restorative* value. I can personally vouch for the reality of that; to give one recent (and recurring) example, I have several times felt so swamped that I *had* to get completely away from editing and go camping for a weekend—and while doing so woke up in my sleeping bag and found my next editorial ready and waiting to be put on paper. I doubt that I've ever met anybody who didn't need that restorative value from time to time—though I have met many who deny the need and boast of going years and years without a vacation. Personally, I suspect it's a pathology of our culture that that sort of thing is so widely considered admirable, and that so many people feel obliged to feel guilty or apologetic if they take time off for themselves.

And it *is* culture-dependent and not a human universal. I've talked to many people from other countries who expressed surprise and dismay that Americans do not get at least four weeks' vacation as a matter of course. Maybe their cultures are more willing than ours to admit that people need breaks from routine stresses, that even employers benefit when their employees take a breather, and that it's not necessary to spend every waking minute Looking Busy.

Some adults do recognize these things, having seen their own efficiency and productivity decline over a long period of steady work and then pick up after a vacation. Even employers can recognize that kind of benefit, since it can be described in "cost-efficiency" terms. Fewer are willing to admit that they don't consider cost-efficiency and productivity the ultimate human values or the only ones worth considering, and that the chance to spend part of one's

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life doing something beyond making a buck is one of the things that make civilization worth having.

Either way, adults tend to forget that such considerations apply not only to themselves, but to school kids as well. They're well aware of the stresses in their own jobs, but trivialize those of school. The fact is that few adults work the kind of hours, under the kind of pressure, that a conscientious high school student is subjected to. (Lately it has become fashionable to extend those stresses to earlier and earlier ages, apparently with no understanding or appreciation of how damaging they can be. Psychologists are seeing more and more *preschoolers* being driven to neurosis by parents obsessed with seeing them **ACHIEVE!**.) Both students and teachers *need* a break from that pressure periodically, if only to prevent "burnout."

There is one more consideration that needs to be stressed, concerning a subtler kind of educational benefit of school vacations. The spread of automation continues, and will continue, to reduce the need for many kinds of human labor. Our society, with its perverse obsession with Planned Activities and Looking Busy, persists in viewing this as a terrible problem. I still hope that eventually we will mature enough to recognize and seize upon it as an unprecedented *opportunity*. That will take time; for a while, I suppose, the forces of Busyness for Its Own Sake will continue to invent work that doesn't need to be done, to stave off "technological unemployment." Eventually, though, I think they will find that their efforts to generate busywork can no longer keep up with the forces making it unnecessary. They will finally be forced to accept the fact that they have been given an unprecedented degree of freedom to do what they would *like* to—and that they had better restructure society to take advantage of that fact. When that happens, most people will have a lot more leisure time on their hands than their ancestors ever did. School vacations offer an excellent opportunity to learn how to *use* leisure time. Conscientious work is important, but so is relaxation—and already many people literally don't know how to do it. If school vacations are eliminated or reduced to insignificance, people will have little opportunity to *practice* either relaxing or exploring and developing their own interests.

And we may find ourselves confronted with the odd (and sad) contradiction of a population that finally has the luxury of abundant free time—and no idea what to do with it. ■

●Nothing puzzles me more than time and space; and yet nothing troubles me less.

Charles Lamb

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1987 SCIENCE FICTION GAMES OF THE YEAR

Matthew J. Costello

The gaming columns of the two magazines have been running for nearly six years, and I have, to date, filed forty-four columns for *each* magazine. It's been an intense scrutiny of the game world, one that I continue to enjoy.

But with so many games being looked at, played, and then stored in my attic, it seemed like time to single out games of unusual merit. The number of awards was not set, but the criteria were pretty clear—e.g., that the games represented what a game should be.

From an initial list of over two hundred games or so (some found in the honorable mention list at the end of this report), eight were selected after many evenings of group play testing and full days comparing the winners.

The 1987 Gaming Awards winners in alphabetical order, if you please, represent today's state-of-the-art . . .

Aliens (**Activision**, Drawer 7207, Mountain View, CA 94039) had a lot to live up to. The film was a breathtaking roller-coaster of SF/horror, with a smidgeon of Heinlein's *Starship Troopers.* The computer game makes good on the challenges, with a series of sequences that capture the highlights of the film . . . landing on the planet, teams separating and meeting the aliens, Ripley searching for Newt, all leading up to hand-to-hand combat with the mother alien. Great gameplay, and exciting, animated graphics worthy of the subject.

Cathedral (**Mattel Toys Inc.** 5150 Rosecrans Avenue, Hawthorne, CA 90250). The rules can be learned in five minutes. Basically, players take turns placing irregularly shaped medieval buildings on a square board, trying to control space and encircle an opponent's lone pieces. But the subtlety of the game comes from its affinity to the classic game of Go. It's tremendously appealing to play, with wonderful playing pieces.

Defender of the Crown (**Cinemaware**, 4165 Thousand Oaks Blvd., West Lake Village, CA 91362) caused quite a stir when first released. For the first time a computer game seemed to actually care what it looked like. The graphics were, in a word, stunning. *Defender* offered a medieval world of jousts, raids, and swash-buckling swordplay beautifully brought to life. More than any other game in recent years, it has pointed the way to the future.

Dungeonquest (**Games Workshop**, U.S., 8920 A Rt.108, Columbia, MD 21045) shows that old dogs can be taught new tricks. The Swedish company Brio took the time-honored game of dungeon crawling and loot gathering and added enough bells and whistles (game slang = "new ideas") to make the most jaded dragonslayer take notice. With a clever combat system, and over seven decks of cards, the game is always fresh and exciting.

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Maniac Mansion (**Lucasfilms Games**, PO Box 2009, San Rafael, CA 94912). Okay, so it doesn't sound like the most profound game title. But this computer game, with its mysterious comet, mad scientist, and group of curious teenagers, is one of the most enjoyable games of the year. Players can control up to three of the teenagers (you'll need one of each stereotype), and the game keeps the action moving by "meanwhile" sequences that are straight out of your favorite B-Movie. Completely joystick controlled, it's a wonderful adventure game after a hard day hitting the word processor keys.

Solarquest (**Western Publishing**, 1220 Mount Ave., Racine, Wis 53404) shows that a board game doesn't have to have ties or deal with combat, to be successful. Essentially *Monopoly* in space, the game succeeds in turning interplanetary wheeling and dealing into a very entertaining (if unrealistic) game. This one, as they say on TV, is for the whole family.

Shogun (**Milton Bradley Co.**, 1500 Main St., Springfield, Mass. 01101) is a masterpiece. With a surprisingly intricate rule book for a mass-market game, in play, it is exceedingly smooth. Players struggle over feudal Japan with plastic armies of samurai, ronin, and, of course, ninja. Much care was given to the art, and the rules provide for just the right mixture of strategy and duplicity.

Traveller:2300 (**Game Designers Workshop**, PO Box 1646, Bloomington, IL 61701) is almost a daring role-playing game. These days, role-playing seems a field filled with licenses and quirky appeals to a narrow audience. *Traveller:2300*, on the other hand, sets out to present state-of-the-art interstellar role-playing. With finesse, polish, and a mind-blowing star chart, the game succeeds admirably.

Eight games, very different with some commonalities. First, the board games are concerned with the physical nature of things. The games look good, and play even better. In an age when computer games can handle dice rolling, number crunching, and a host of other game activities, boardgames should offer the physical *pleasure* of playing with a game.

The three computer games all attempt to stretch the game play and look of the computer game. Games that follow these three will not look the same.

Now, some honorable mentions . . . all of these games are well worth your time playing.

Interceptor, a Star Wars type boardgame with an absolutely remarkable starship damage system, from FASA.

The Legend of Zelda, a role-playing game for the Nintendo system. A phenomenal success . . .

Pirates, an atmospheric adventure game from Microprose, set on the Spanish Main.

The Sentry, a Firebird Computer Game from the U.K. Hundreds of alien landscapes, all of them guarded by an extremely diligent robot.

Star Flight, the most comprehensive computer game of deep space so far, from Electronic Arts.

Wizardry, a classic role-playing computer game, from Sir Tech.

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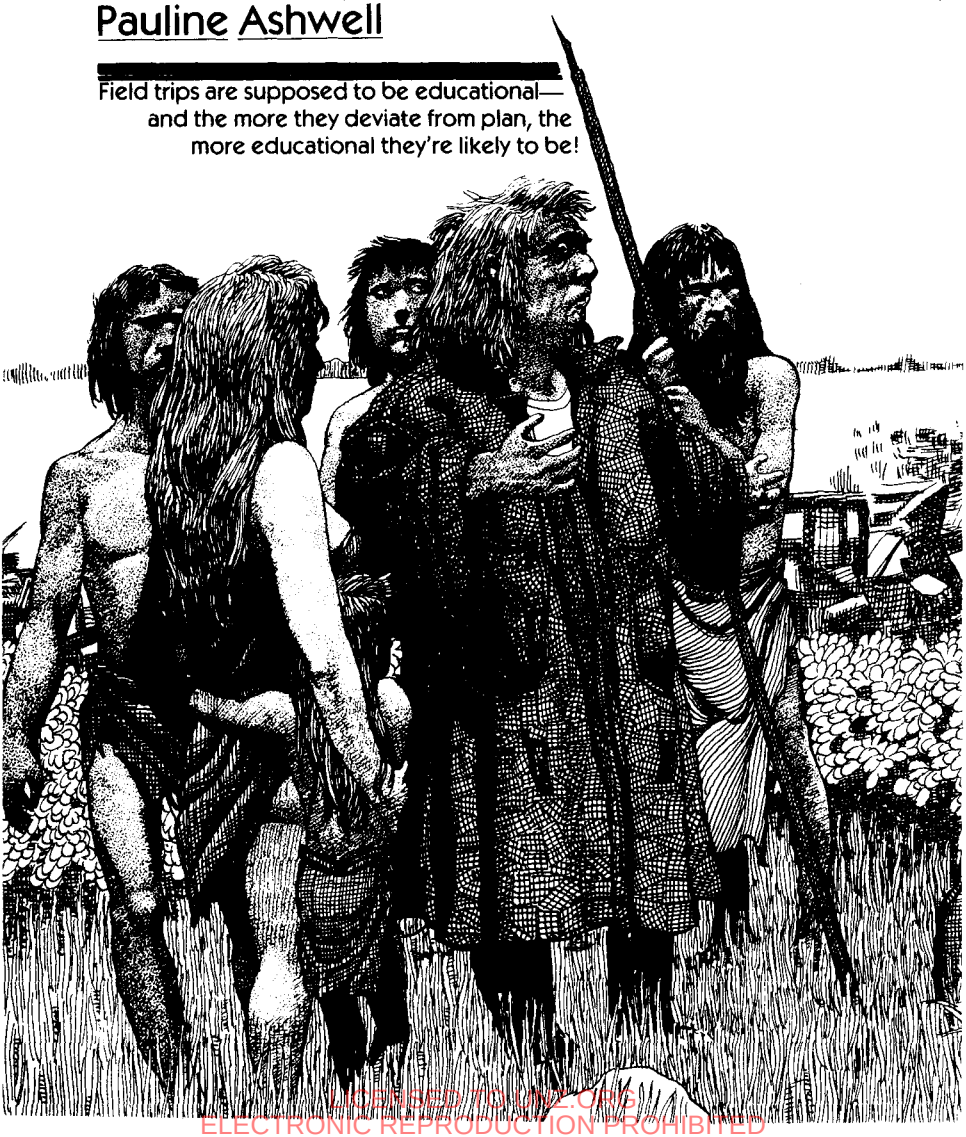
FATAL STATISTICS

Pauline Ashwell

Field trips are supposed to be educational—
and the more they deviate from plan, the
more educational they're likely to be!



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I wish somebody would tell me what the hell is going on.

Seeing the one and only reason why *Cutty Sark 527* has gone into orbit around Figueroa is to land me so I can start on my Field Work, and

Seeing M'Clare arranged it through Influence with the Directors of the Frontier Line and it adds two days to the journey and Captain Maddock is fit to be tied, and

Seeing I was instructed a couple of hours ago to get my bags packed and my goodbyes said ready to jump into the Lander the minute we returned to phase,

Why am I still sitting here, although this Superannuated space scow dropped out of hyperspace fifty minutes ago?

The Captain is *not* maneuvering for landing, because *Cutty Sark* has been in synchronous orbit over the Space Field since five minutes after dropout. I can see the Field on the repeater screen they have given me; a plain whitish ragged-edged patch like they all are except on the half-dozen oldest planets of Civilization. . . .

This reminds me that three out of the five Reports on Figueroa which formed the main part of my briefing started off something like *Figueroa's current problems are illustrated even before landing by the first view of the Space Field*; I don't see what they mean by that, it looks pretty much like the Field at Home.

Then I remember that my home planet Excenus 23 has Pop 3,500 or thereabouts, whereas the last best guess at Figueroa's was 3,500,000; not yet self-sufficient for anything except basic foods, they must have at least ten times as much traffic: Where does it all go?

I am distracted from this question by the observation that the Captain is getting some sort of Bad News over the Intercom, complicated by Custard Daws who is acting out his Anxiety Complex into the other ear.

I spend perhaps thirty seconds wondering what Custard is Disturbed about *this* time and then go back to the Repeater screen.

The controls on this cannot change what the big scope in *Cutty Sark*'s belly is actually looking at, of course, but I can call up some magnification; I enlarge the view of the Space Field until it starts to fuzz up and begin looking for Clues.

Now I can just see a regular pattern of Marks which must be the Landing-and-Launching pylons. . . . There are twelve in the pattern, four sideways by three down; (Excenus Field has two rows of five) . . . There seems to be bare ground around the Field, very dark. . . . Then suddenly a Pattern jumps out at me; not a new one but the pattern of the Pylons, the same spacing exactly continued on into the Dark. Shadows do not show on this ground, but there are the Pylons themselves like little straight silvery Dashes, rows and files of them extending practically forever. . . . well, nearly up to the top of the screen at this magnification . . . and up at the very top are big sharp-edged shapes, oblongs and Ls with something rounded in the middle . . .

I call to mind a picture of the Space Gate, Figueroa, from the earliest of the Reports, which still had a good deal in it about *This rapidly developing new*

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member of the Community of Planets; Yes it could be: Yes it certainly is, I remember the Rotunda in the middle. The Dark stuff is almost up to those buildings; What the hell has been *happening* to this planet?

Not an outflow of lava, I don't think, the pylons would have Melted . . . anyway it would not have stopped like this at a square Perimeter with the Space Field or part of it untouched in the middle . . . but *something* has certainly engulfed a lot of the landscape—

"If I may have your attention, Miss Lee—!"

Great Godalmighty . . . I hurriedly haul myself back into my Skin and give my attention to the Captain; he evidently reverts to being an Authority Figure when Disturbed, seeing he started calling me Lizzie more than two weeks ago.

He says "Did you come across any mention of Figueroa's Ionosphere while you were doing your homework, Miss Lee?"

This is Not what I expected; after a second or two for adjustment I come up with a possible answer; "Hyperactive, isn't it?"

"Exactly," says the Captain, and gets stuck.

I say, "Are you having trouble getting in touch with my friends down there?"

Which Ought not to be the case; I now remember that Figueroa's Space Gate has an extra heavy duty transmitter punching signals through the Ionized layer and a Relay satellite beyond to unscramble Interference.

The Captain says "Trouble!" and pushes his hand through his hair to Illustrate; then he remembers this is not Captain-like behavior and hurriedly smoothes it down again.

"Look, Lizzie—" I think the change in approach is Diplomacy not Forgetting—"something's wrong down there. Very wrong. Old Sparks has been trying to get an answer from the Gate ever since we came out of phase, but not a whisper. Not even a carrier beam, the transmitter's dead."

I think carefully how to put it and then say "Did you have any luck on Laydon's call number?"

Captain Maddock does something funny to his Mouth, not exactly a snarl or even a Pout . . .

"We tried that, of course. . . . In fact Sparks put out a call on automatic repeat. He did get something, once. Solar wind let up for a minute or two, a few words came through. Pretty garbled, at that."

I say, "But Laydon's still on the planet?"

"Someone answered on that wavelength, yes."

So at least my friend B Laydon's Elder brother has not been Swallowed up without a trace. . . . I say, "So how soon can I get down?"

The Captain heaves a great Sigh and drops on to the seat opposite.

"Look, Miss Lee . . . Lizzie. We don't know what's happened on Figueroa. The latest news I have of the place is nine months old. Place was no worse than usual then. But something's wrong now—badly wrong. . . . Planet's been going downhill for years, looks as though it's gone. . . . Better come on with us to New Peru and fix up a passage back to Terra from there."

And spend God knows how long

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planet-hopping—no shipmaster goes straight from the Outer Reaches to Terra—while *Pedagogue* lands on Figueroa four weeks from now, and picks up Donald Laydon and the others and takes them back to Russett College to report No Lizzie Lee . . .

Like hell I will.

The Captain says persuasively "We can get a message to Laydon—our transmitter punches through the ionosphere clean as a laser. It's just that *his* transmitter hasn't enough power when it comes to replying. He'll tell your Professor what happened when he gets picked up."

Tell M'Clare I came out here, five weeks' travel, and then hadn't the guts to do my Field Work after all? No way!

Everything went wrong with my Field Work right from the start—or before it; two days before I was due to take ship, I broke my wrist. I could have perfectly well finished the Forceheal treatment on board ship, but M'Clare said No; the first twenty-four hours of any voyage are spent in Free fall while getting far enough away from the Solar system to go out of phase; Bones need Gravity to knit properly and I am *not* going to return you to your Father with a crooked arm, nor do I propose to let you waste time next semester going back to the Hospital to have it broken and reset, Stop arguing with me, Lizzie! and try telling me how you *really* came to break it, instead.

I did it Fooling about on antigrav, which is strictly forbidden and I ought to have had more sense. I changed the Subject; but I was still not allowed to go.

So *Pedagogue*, which was taking the Field Study party to Figueroa, went without me and I had to proceed by Commercial carriers with two changes on the way, arriving nearly a month after everybody else.

I spent most of the time *en route* studying up on Figueroa but it looks as though my Information is out of date.

Not that I expected to find the place in good shape. It has notoriously been going downhill for years, but fairly slowly; so far the Sponsoring planets have always been able to claim there was Light around the corner, Immigration/Emigration about to stop being too fast/too slow and Production becoming greater/more varied/better balanced, nobody really believed that sort of thing but it would have been a worse sign if it had Stopped.

Something has definitely Stopped now.

However if Donald Laydon can Survive down there sufficiently to answer radio calls, then So can I; Captain Maddock finally gives up arguing and accepts that this is the case.

I then discover why Custard Dawes is in more than his customary State of perturbation; it is his turn to operate the Lander and the Captain refuses to let him off.

Poor Custard confides in me on the way down that he could have got someone else to do it for a quite trifling sum, if he had been allowed to. Actually this rule was made in the first place because taking down the Lander is one of the jobs the crew usually *wants* to do; it is a bit ironic that Custard is Stuck with it now. He spends the first half of the descent trying to convince me we had better both turn Back to the ship.

He spends the second half grumbling,

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while I alternate between trying to raise Don Laydon personally and keeping an eye on the screen. I don't have any luck with the radio but *Cutty Sark*'s Communications Officer is putting out a continuous message telling Don where and when to pick me up—Talking of which, Custard is making for the whitish area not engulfed in whatever has overrun the rest of the Space Field and I remind him that Captain Maddock said we should land North of the Space Gate, off the Field itself, because the dark stuff has covered the access roads and if it is something Impassable Don may not be able to bring his Transport to pick me up.

Custard does not like this reminder. Custard does not like anything about this trip, but if he has any reasonable reason for objecting to the chosen spot he is not going to explain it; I insist on stickng to Plan.

During the last half-kilometer of the Descent I discover what the dark stuff is on the Space Field.

Huts. Or, seen from space, *roofs;* thousands and thousands of them, made of sheet-plastic and sheet-metal and old doors and planks nailed side by side. They are mostly dark, but as we get lower I can see light-colored bits here and there, also assorted Shadowed interiors where the roofs have fallen in.

No people in sight, whoever put the huts there have Gone.

Custard finally consents to land in the place Captain Maddock told him to, which is presumably where Don Laydon will come to find me. I am not going to tell him, but the sight of those acres of empty huts has Shaken me quite a bit and I wish very much I could call Don to confirm that he is coming, but all I get out of the radio is Noise.

I request Custard to Open up so I can get out and take a look around.

His reply is something like as follows: "Look, Lizzie, I mean Miss Lee, I mean, this place is *bad news,* that's what it is. Why don't you just sit where you are and let me lift you back to the ship?"

I have learned over the last three weeks that it is absolutely No use getting cross with Custard, but I do. The fact is, this Landscape is getting on my nerves and for one craven moment I was tempted to follow his suggestion and go back to the ship.

So Custard's feelings get hurt and when he finally operates the switch to open the door he is gazing Straight ahead so as Not to have to pick me up if I catch my foot in the doorsill and fall on my nose, I suppose this also avoids Disappointment when I don't.

Outside, it is nearly noon of a really beautiful day. I have stepped out on to a well-shaved bright green lawn edged with flower-beds; was all that Desolation seen from orbit some kind of Delusion? Then Common sense comes back and I turn my head.

Getting out of the Lander I was facing *behind* it; when I look towards its nose there are the Ruin and Desolation as before.

Worse, because now I can Smell it as well.

I got taken to see the remains of a Forest fire once, part of my Orientation; it had been put out by rain (one of the

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things for which Terrans *do* use Weather satellites) and smelled just like this.

Figueroa has large forests, it says in the Reports; for a moment I think one of them must have Burned, then I remember that they have been Extensively cut down for building; in fact, what I am smelling is burned Hut.

So that is what made the Dark patch.

Just as I grasp this, Custard lets out a Yell.

"Lizzie! Get back in here! Lizzie! *Now!*"

I look quickly into the Lander but nothing is Biting him that I can see; I take a couple of steps towards the rear of the Lander, meaning to see What if anything is on the other side, and something hits me in the small of the back and knocks me flat. Then there is the *whoosh!* of the doors closing, and when I roll over the Lander is six feet up and retreating rapidly into the sky.

In the Course of my life I have learned a number of Words for situations like this and people like Custard, but none of them seems adequate. I just sit up, feeling a bit dizzy, and look to see what Hit me.

It was my baggage. I expected to be six months on this trip and therefore brought nearly seven kg of clothes and stuff; it is now Lying on the grass at my feet.

Thank goodness my Reading machine was fastened to my belt instead.

Then I look further and see what frightened Custard into hysterics.

People. Just people, about six of them . . . No, more bob up out of the flower beds or somewhere; ten. Or twelve. Probably sixteen . . . To hell with counting. They are various shades of Dark, some as black as my friend Likofo Komom'baraze, others more like Maui Smith.

Anyway, they all look perfectly harmless. Only a bit odd. They are dressed mostly in bits of cloth wrapped round them and tied; and not much above the waist, except one old lady who is wearing what looks like a Uniform jacket six sizes too big.

Then I see that Two or three of the Recent arrivals have long shafts with metal bits at the top, and one has a knife about two feet long.

On the other hand at least half of them are half-size or less; two of them on all-fours. And the one with the knife has been chopping down bushes; there is a pile of them on a flower bed nearby—

One of them steps forward; the old lady. She only comes a couple of paces, then calls to me "Young lady! You take that radio, tell that man, make him come *back* here! This planet is a *bad* place to be!"

That was what Custard had said.

The rest are all making sounds and Signs of agreement; the ones with the long sticks thump them on the ground. The small ones look solemn. . . . I do not think I am going to make any impression on Custard even if my Wrist radio can get through, but the advice seems well-meant and I do not wish to be Uncooperative, so I set it to the Lander's call frequency and try.

After six tries and Silence, except for static, I try Don Laydon instead; this time I think I get an answer, at least the interference noises at one point sound rather like *Lizzie*, but I can't be sure.

By this time the people have come

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closer and I decide to stand up. It is Odd to find myself looking down on half a dozen heads; being 5ft 1 in. I don't think I ever before found myself partly surrounded by People shorter than me.

The old lady addresses me again. "That man is a *bad* man!" she says.

The rest shake their heads and agree. I know Custard is not really a bad man, but so far as the present situation goes he might just as well be; I shake my head too.

The old lady says, practically, "What you go do?"

I explain that I have some friends on the planet who are going to pick me up any minute now; evidently they are all Doubtful of this, but polite.

I say "What has Happened to this place?"

They all look round, rather as though they never saw it before.

I look round too. At second glance, the big buildings of the Space Gate are showing signs of battery as well as wear. Several of the big windows are starred here and there and one has a crack right across. There are big gaping holes where the doors used to be; through them I can see stumps where the counters in the foyer have been broken off, and if there were chairs, they have gone.

The grass is probably taken care of by some sort of automaton; but not the flower beds, I now see that the ones that still have flowers also have Weeds. The nearer ones have been dug up and planted with Green things in orderly rows, like crops.

I am about to ask whether they all Live on this spot and if so, *why*, when my radio suddenly springs to life.

"Get ready to jump, Lizzie! Here we come!"

This is said in my Earpiece; I guess the old lady has one too, relayed to by a broad-tuner somewhere, because she Jumps and says something startled to the others and they start to back away from me. Which is Just as well, because a few seconds later there is a suddenly approaching Whizzz! and here comes a Floater a lot faster than is safe in these surroundings. It seems to be heading straight for me, then swings sideways at the last minute as someone leans over the side and makes a Grab for my hand.

I Jump as instructed and get hauled aboard, landing on the floor of its tray-like back end, in an Undignified Huddle with the Astral Cad.

A.C.Van Hatton is not a person I would choose to be Tangled with if my Preference had been consulted; I Sort myself out with more Haste than Care and lean over the side to wave Goodbye to my recent acquaintances. Some of the grownups look as though they are in two minds about Shaking their fists, but several of the children wave back.

The Vehicle is swinging round in a half-controlled half-circle that brushes its underside against the remains of several Huts. It then starts streaking down a broad highway between Trees, most of which have had branches untidily lopped off. I cling to the side and yell "Why the hell did you do that?"

The Astral Cad raises a long thin hand, hooks it over the side of the Tray and languidly hauls himself sitting up.

"Lizzie, my sweet," he replies, "why the hell didn't *you* do as you were told?"

I reply that I was Told to come to

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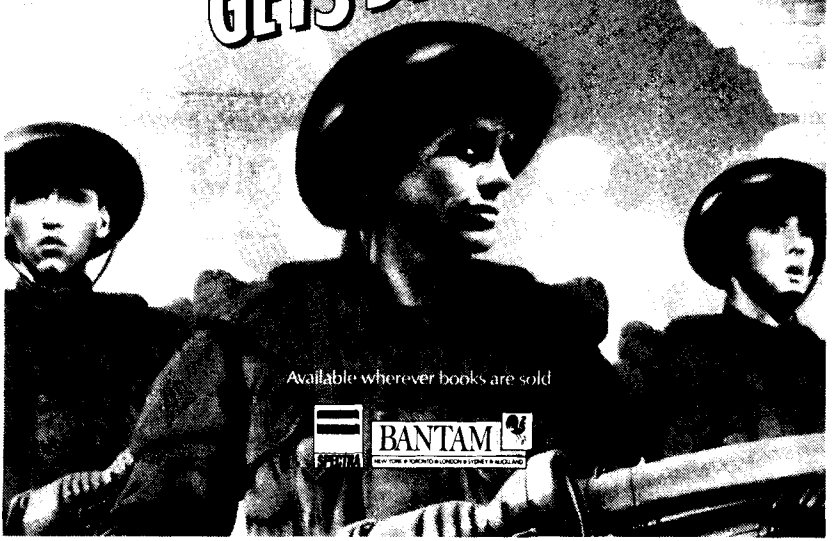

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Figueroa to do my Field Work and that's what I have done.

"I am referring, my poppet, as you very well know, to the message sent by Our Gallant Leader to *Cutty Sark*, telling you *not* on any account to land."

Oh.

I say, "The ionosphere is acting up. The only message we got was too garbled to read, except for a few words. It showed Laydon was still here and that was all."

This is Perfectly true, if it sounds unconvincing it is because since landing I have Deduced that the message probably said something of that sort.

"Well," says the Astral Cad, "that's your story and no doubt you'll be sticking to it. Hold tight!"

The Vehicle suddenly does a 90° turn down what I suppose is a Side street. It is lined with skeletons of houses, made of wood. I mean the Skeletons are made of wood and probably the houses were wood throughout; tag-ends still attached to the upstanding members indicate that the spaces were filled with Wooden planks. All the doorways are gaping empty; I suppose this is where the materials for all those Huts came from; but What has been going on?

I say, "What *happened* to this planet, forgodsake?"

The Astral Cad might or might not have been too Tired to answer, but the vehicle goes into a series of loops and twists around and between Houses that threatens to throw both of us in a tangle again and puts a Stop to conversation.

Evidently we are Dodging something, but *what?*

The Alternation of straight spurts and bouts of twisting goes on for some minutes, taking us beyond the area of houses; then we turn up some sort of Forest path and go hell-for-leather a couple of minutes far too close to a lot of trees. Then a row of Dilapidated houses appears and the vehicle hurtles straight at the near end and dives in.

I mean the End wall shoots upwards, leaving a gap, and a moment later we have stopped dead inside. The wall drops rapidly but quietly behind us and apparently we have Arrived.

"Welcome to the Hulk," says the Astral Cad.

I look round the space enclosing us and say *"This is a Ship!"*

The walls are Grey-painted metal with ridges of welding and curve up into the Roof without a break.

"Top marks, poppet," says the Cad. "It stopped going places yea these many years ago, but it *is* a ship."

"It *used* to be," says the driver of the Vehicle, climbing out of it.

Just as I suspected, it is Blazer Weigh.

When I first saw the Astral Cad I thought he was an Absolutely Typical Terran, bored at ten, cynical at six and *born* looking down his nose; then I discovered his family had been on Alpha Centauri 9 for seven generations.

Some time in the next semester I heard M'Clare say, "If a person, or an institution, seems to be absolutely typical of a particular planet, or nation, or group, then he, she, or it, is probably a fake. Or, to put it more charitably, aware of the stereotype and self-designed to match."

A.C. Van Hatton has deliberately Designed himself to match an Outsider's

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Stereotype of a Terran, you could hardly be more Peculiar than that.

(Actually I have yet to meet a genuine Terran, on Terra, who is even a halfway match for the Type; the ones who go *off* Terra are probably the Originals for it.)

Blazer Weigh, on the other hand, has deliberately Designed himself as a match for the Astral Cad; somehow this is Obvious although the final Result has little if any resemblance. I mean the Astral Cad talks all the time and believes himself to be witty, Blazer hardly opens his mouth and is Visibly under no delusion as to what comes out of it.

All the time, though, you can see poor old Blazer trying to be as Arrogant Blasé Callous Decadent Enervated and Etc. as his Model and Chum, and not coming within a Mile of it.

But Where the Cad goeth there is Blazer, and when Priority Catford gave out the Assignments for Field Study she seems to have decided Not to fight it; here they both are.

"I stand corrected," says the Cad, giving his Friend and admirer a weary look, "This *used* to be a ship."

Well I have seen disused Spaceships converted into Dwellings before now, there are several on Excenus 23 providing accomodation at Outlying mining areas. There are obvious advantages to it, you get a Weather-tight shelter with all necessary Life-support such as water recycling, sewage disposal, air regeneration, and so on. I can see it being Particularly useful under circumstances like now, since you can Hole Up inside and completely avoid whatever is wrong with the Environment.

But I *don't* understand how it got *here*. Russett has only been using Figueroa for Field Work for about three years. How was the Ship put in place and camouflaged, within a quarter of a mile of a fairly large town, without the Inhabitants being aware of it?

I presume they weren't because I don't see the point of the Camouflage if they were.

I climb over the side of the Tray and drop to the ground, taking my baggage with me; Blazer makes Half a movement to take it over but I hang on. Then a door irises open at the far end of the Hangar and Don Laydon walks in.

This Brother of my friend and roommate B was a Third Year student when I first arrived at Russett, and therefore Graduated just over a year ago; he has been doing Postgraduate work on Figueroa for nine months.

The Astral Cad droops over the side of the Tray and says languidly "Here she is, Laydon. Your message forbidding her to land got garbled. So she says."

"Since you went to fetch her, we've had signals from *Cutty Sark* saying the same thing," says Laydon. "They only got an occasional word of ours."

He sounds calm, courteous, efficient and in charge. Also he *looks* ten years older than when I saw him last, and Tired to death.

I say, "Don, if it was wrong to land here, I'm sorry."

He musters quite a good grin.

"It's all right, Lizzie. I'm afraid you're stuck, though. *Pedagogue* won't be back for four or five days. Field Work's off. You're going to be bored to death."

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I say "Look. Can somebody explain what the hell *happened* to this planet?"

Blazer Weigh says, "The population's been evacuated."

Nobody laughs

But—the *population?* Three and a half *million?* How? and what *for?*

Don says, "It's a long story. Come on into the living quarters and we'll try to explain."

The door through the back wall of the Hangar leads straight into a little House belonging to somebody else.

The room is Ethnic but stiff. Walls covered with sheets of wood, heavy wooden furniture with no upholstery, only cushions, and one big square dark-colored rug in the exact middle of the floor.

Then I realize it is all rather clever Camouflage; door and window are built into the open Main Hatch (but with nothing to stop it being shut in an Emergency) and the rest is just a decorated Box fitted into one compartment of the ship, so if some Official or Passerby decides to investigate this Row of houses in the middle of nowhere at least one of them will give a fairly convincing impression of being somebody's Home.

We walk straight through and out a door on the other side and are back in the Ship.

I am offered a meal, a drink, and the use of a Bathroom, accept the last two and after a short Interval settle down with a glass of reconstituted fruit juice to hear what Don Laydon has to say.

At first this seems to be Nothing and I fill in by asking where Kirsten and Mishi are?

All three of the men exchange Glances and Don says heavily. "Yes. Well . . . they aren't here, Lizzie. In fact, they never landed. They went back in the *Pedagogue.*"

The Astral Cad drawls "Carlotta and Mei Lin left too."

Which makes me the only Female member of the Study group left.

Don Laydon pulls himself straighter in his seat and says "Buren and Hsuan left as well. They were injured in a riot and the medical services here were swamped—what was left of them. Van Hatton and Weigh gave up their places on the *Pedagogue* so that they could be taken for treatment."

Maybe my eyes Widen or something. He adds hurriedly "That sort of thing's all over, of course."

"Nobody left on the planet to riot," says Blazer Weigh helpfully.

I say "For god's sake, how *could* they evacuate three and a half *million* people?"

Don rubs a hand over his face and starts to look *twenty* years older now.

"Look, Lizzie, just listen and I'll try to explain. . . . Nobody really intended to evacuate *all* the population, they just . . . Look, I'll have to start from the beginning . . . "

Figueroa is unique two ways.

One, when it was found thirty-seven Standard years ago, it was already terraformed. Theory is that one of the Generation ships built before the Breakdown found the planet and planted a complete Terraforming package, with different units designed to become effective one after another as Conditions became right for them.

Two, Figueroa is at one end of a Wormhole, one of these Structures in

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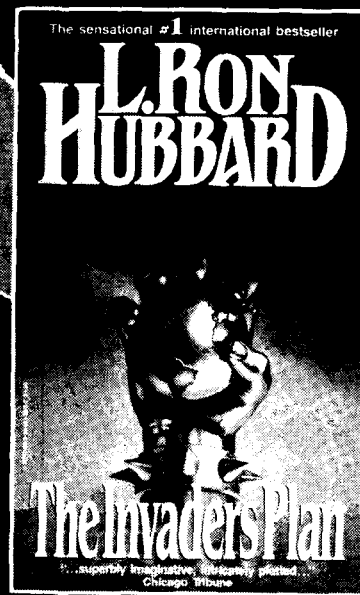

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space that you can travel in for light-weeks and end up light-years from where you started; and the other end is quite close to not one but *three* inhabited Star systems.

Naturally a Terraformed planet belongs to the people who Terraformed it. But Who does it belong to when the people who did the work have gone over the horizon most of a millennium before?

When news of Figueroa got back to the Known volume it set off a free-for-all no one was in a position to control. Some immigrants were sound Pioneering groups. Most weren't. Some landed with just a Wad of cash and asked the way to the nearest Hotel.

Most of them came from the planets near the other end of the Wormhole; New Nassau, Rosemary, Baliloa. Soon Stories started to come back of Planetary nationals starving, farms robbed, people selling themselves into slavery for enough to eat. The kind of things everybody thought were Long gone from the Human scene.

The three planets sent in Aid and got things more or less straight; then they set up a Corporation to manage the place.

The Corporation did some work on finding Cash crops, exportable minerals and so on, but the Payingest line they came up with was to build houses with local Timber, bricks and tiles and sell them for the offplanet cash new residents brought along. When locally produced Food got inadequate they used some of the cash to import more.

Okay, as a System it teetered, getting nearer Ruin with every shipload of immigrants who didn't bring money (they tried to enforce a Minimum but they couldn't keep the ships long enough to send the poor ones back) and swinging Back when they got in a load of comparatively well-to-do or Cash crops had a good year. Nobody trusted it to Last forever but it was expected to hang on for some years yet, maybe till some Local group worked out something better and managed to make it Stick whatever the Corporation said. Nobody and Nothing had predicted a sudden total Catastrophe.

I say "I read the Reports up to eleven months ago."

Don nods slowly. "It started to crack a couple of months after that. No time for the news to get back to Earth yet."

No chance for M'Clare to learn the score and Reroute us.

"The Corporation didn't do the Terraforming here," Don says wearily. "They got it ready made. And most of the immigrants came from planets terraformed several generations ago. they didn't know how it was done or how fragile the ecology was. So they cut forests down all round the main settlements and didn't do much to protect the exposed soil, and just after I got here we had a long drought, and forest fires, and then the winds started."

He sounds unutterably depressed about it and no wonder. "The topsoil started to blow away. A lot of crops were ruined. The Colony started the winter with about half the food needed to get through it, and no cash crops to pay for imports.

"The Corporation would have had to go light-years into the red to keep things going. Instead, they decided to fold . . . Rosemary sent in a team to

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investigate. They recommended lifting out part of the population, instead of sending in food—it actually worked out cheaper, in transportation terms.

"What they *meant* to do was to evacuate the least productive part of the population. What *happened* was that some of the people in key jobs decided the Corporation was leaving them stuck with the baby. So *they* left. Services began to break down. People panicked. They took off any way they could. Rushed freighters and wouldn't let them take off till they were packed to the bulkheads with people. Presently no independent shipmaster would land on Figueroa at all.

"People on the three planets who had relatives here started to raise a major stink. In the end the governments were just about forced to arrange a mass evacuation for those who wanted to go. You've never seen anything like the ships that put down on the Space Field; big old arks that had been mothballed in orbit for a couple of centuries, some of them. Most of the passengers traveled under narcosis, so food and water and services could be minimal. The first estimate was, they'd have to take another half million; only once again, a lot of the ablest people pulled out.

"Within three months of the first evacuations just about everything had gone heisenberg. Dominoes falling over. If people in towns wanted food they had to trek out to the country and barter for it, with whatever they'd got. There are barns out there half full of knicknacks from a dozen different planets. A lot of those farms have been deserted, now. Farmers panicked in the end, like the others, and came pouring into town looking for a ship. They were so afraid of being left behind, they wanted to be right on the Field. Those that could, camped in the Space Gate buildings; the rest grabbed materials from anywhere they could and made huts on the Field itself.

"God, it was a mess. The sanitary facilities in the Gate buildings held up pretty well, but water was always running short. They had burial parties at first, but for the last few days if somebody died in a hut—the ships wouldn't take anyone very old or very sick—anyone else there just moved. . . . After the last ship took off someone set the huts on fire; cleaning up, I suppose."

Don closes his eyes and shakes his head violently, as though to get rid of Memories; he is looking exhausted. After a moment, however, he opens them again, and says "The last ship left about three weeks ago.

"Just after we arrived," drawls the Astral Cad. "*Pedagogue's* skipper wouldn't land—quite rightly, she'd have been mobbed. He put us down by Lander, hard by, and Our Leader here came forth with a portable flashlight to lead us in. Fortunately, there was a code designation for this place and they both remembered it."

I say, "Yes, but where did you *get* it from? Even M'Clare couldn't get this Ship in, and hidden this close to a town, without people spotting it."

Don says "Oh . . . Yes, of course. It was planted a long time ago, soon after colonization started. Not by Russet, of course. The Terran Bureau of Interplanetary Affairs put it in. They kept an eye on things, quietly, for a good many years; just making sure the

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planet didn't become a pirate's hideout or anything of that sort. Then when the Corporation took over they pulled out."

I say, "Why?"

"Corporation didn't want 'em," says Blazer Weigh.

Don starts to object; then changes his mind.

"I suppose that's true. Anyway, maintaining an Embassy when requests for information and instructions can't be answered in less than four months is a bit of a liability. . . . They withdrew. Then when things really started to go sour on Figueroa they wanted a source of information, so they pressured M'Clare to set up the Study Group here. He refused point blank unless there was a safe place we could withdraw to if it all turned viscous, and they offered him this."

"Safe as houses," says the Blazer Weigh.

A grounded Ship is a lot Safer than houses, of course, provided the Life Support system is intact. You could undergo Siege in one indefinitely if you were prepared to live on Recycled water and food; plenty of spacemen do, for months.

"Cheer up, Lizzie," says the Cad. "The larder's quite well stocked. We shan't be reduced to processed algae and yeast; provided *Pedagogue* keeps to her schedule, of course."

That is Not what is bothering me, and I say so.

Don says, "The Hulk really is safe, Lizzie. Some of the characters who stayed on after the Evacuation are pretty odd, but they can't get in here."

I say, "Yes, but what about Field Work?"

Don heaves a sigh. The Astral Cad heaves another, and gets his Remarks in first.

"Lizzie, love, are you still expecting to sally forth with your little Recorder and find a Typical Figueroan to interview? As Don said, those that remain are thoroughly *un*typical—at any rate round here."

"You really can't expect to carry out your assignment under these conditions, I'm afraid," says Don. "Probably all three of you will be given new ones, when you get back to Russet—unless the Assessors decide to waive that requirement."

I say, "Don't try to tell me you have all stayed Cooped up in here for nearly a month."

"Not completely, of course," says Don uneasily.

I say, "Right. What have you found to do?"

They look at one another.

"It's quite true," says Don at last, "that we've been recording certain data, which may or may not turn out to be useful in the future. But we've done nearly all that we can in that line."

"What line is it?" I enquire.

The Astral Cad takes up the thread.

"Part of the Satellite Survey system is still working—two units out of three, in fact. The relay beam's tight enough to punch through the ionosphere and so far the pickup system hasn't failed. We've been going through the recent data to locate settlements still showing signs of life. The data are all fed into computers, of course, direct from the antenna, but there's every chance of the computers' being down-powered before this planet gets back on its feet, if it ever

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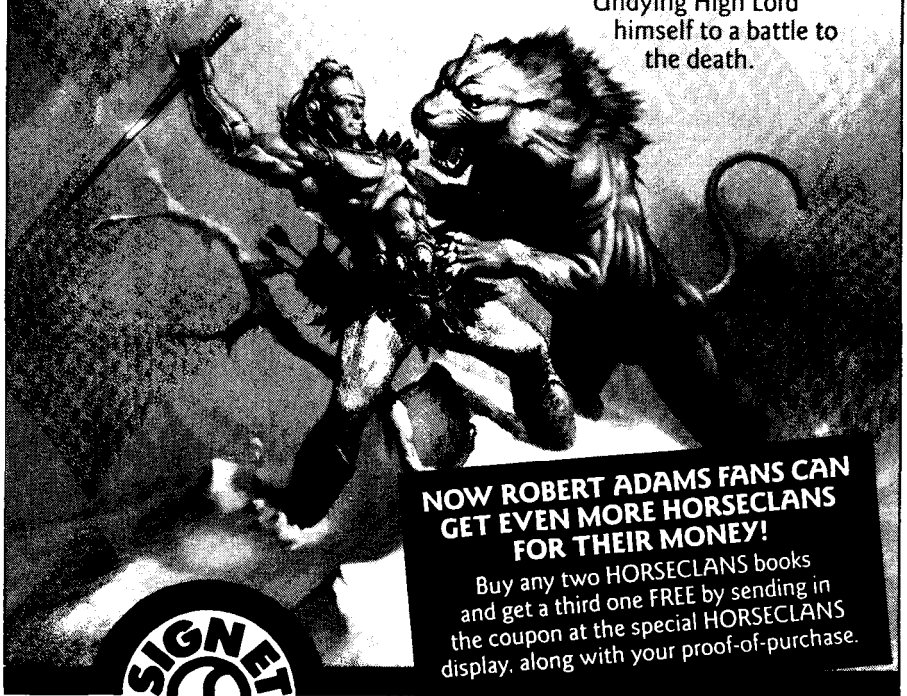

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does. So we've been getting the info into our personal recorders and onto printed maps and so on. As Don said, we've pretty well finished. And, no, you can *not* join in."

I say Nothing, as Pointedly as I can.

"The man in charge doesn't like girls," says Blazer Weigh.

"Or to put it in his own words, the ladies are delightful in their proper place," says the Astral Cad.

"Sorry, Lizzie, but that's a fact," says Don. "We can only get at the computers by permission of the man in charge at the Space Gate—"

I say, "In *charge?*"

"Yes, well . . . the Corporation still has a lot of gear on Figueroa. I suppose it still belongs to them. Anyway they left a . . . sort of caretaker here."

I say, "All by himself?"

Don nods.

"There is some doubt," says the Astral Cad, speaking to the far horizon, "as to the formality of the appointment."

"I've told you before," says Don, "and I'll say it again, since you make it necessary—we've no grounds for questioning the Custodian's authority. He may have been officially put in charge and he may not. *We* weren't. He has the keys and he knows the codes to access the data. If he chose to shut us out we couldn't work at the Gate anymore."

The Astral Cad performs a sort of Salute.

"As you say, worthy leader. There'll be no more to do there after tomorrow, anyway. We'll have covered the whole planet."

I say, "But has the Corporation just *left* him here? How long for?"

The Astral Cad shrugs. "We haven't asked him."

"It's his own choice, Lizzie," says Don. "If he'd chosen to pull out during the evacuation there was nobody to stop him."

Well I think it's a shame. However there is Nothing anybody can do about it at the moment, I suppose. I say, "What are you going to do next?"

"Eat lunch," says the Blazer, getting to his feet. "My turn to cook."

It makes very little Difference who cooks; the food is Prepared by emptying powders into the Rehydrater and setting the heating controls to match what it says on the Packet and the result is just like what I have been eating on *Cutty Sark 527*. Not even the desire to keep me from asking Questions can dispose my Colleagues to Linger over the meal.

When we have put the Dishes in the cleaning slot I ask, "Did you find many Settlements still active in that Survey you did?"

Don says, "Some."

"Most of them," says the Astral Cad, "on Continents other than this one."

I say, "Independent Firsters, do you think?"

Don takes me by the elbow and leads me to a chair, so he can Loom over me. He then makes the following Statement.

"Lizzie. I remember that your Assigment was something to do with the Firsters, but you are not, repeat *not*, going out after them."

I say "Certainly not."

Figueroa has five main land masses. When the one with the Space Field on it began to fill up the Real Pioneers

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mostly Sold the farms they had established and used the money to move to one of the others. Some had settled there already: I suppose they were the *Original* Independent Firsters, but the name got applied to the others as well.

My Assignment was to enquire into the Knowledge Beliefs Attitudes and Opinions of other Figueroan citizens concerning the Firsters, with a view to seeing whether, *One*, Hostility towards them might lead to Trouble in the future; *Two*, will their Example be any use in trying to guide other Figueroans into making better use of the Planet.

I explain this and enquire about groups remaining on *this* continent, preferrably nearby.

Don utters a Groan.

The Cad says, "Lizzie, dear. People who chose to remain on this continent can all be classified as *Eccentric*, to say the least. Some probably did so because they had acquired or built up something they couldn't bear to abandon.

"Some, on the other hand, almost certainly took advantage of the general confusion to collect all the loot they could. Both groups are now holed up with whatever supplies and weapons they could gather, ready to beat off anyone who might try to take their possessions away from them."

"Look," I say, not bothering about tact, "is there any *evidence* that these Looters exist, or do you just think it would be Logical if they did?"

"Oh, they exist," says Don rather grimly. "We ran into one bunch, before *Pedagogue* arrived. That was how Buren and Hsuan got hurt."

"Since then," says the Astral Cad to his fingernails, "we have approached inhabited houses, twice; and got shot at, twice. Whatever their motives, the people remaining in this area of the planet are *not* in a mood to make the acquaintance of strangers."

I say, "What about those people at the Space Field, then?"

Not having been present Don enquires What People and I explain. He glances at the Cad.

"New to me," says that Individual, shrugging. "They were round on the South side, nowhere near the entrance we've been using. Nothing to show how long they'd been there."

I say, "I think they are living there now. Farming there, anyway. They had vegetables planted in the flower beds. *They* didn't try to scare me away. I suppose that Smash and Grab approach was in case they tried to Shoot at you; but they hadn't any guns."

"No way to tell that," says the Cad. "Lizzie, dear, that Smash and Grab approach as you put it is mandatory when picking up anybody on this planet. Not so much for fear of getting shot at as to avoid giving anyone a chance to steal the floater."

That does not seem to make sense: I say, "There must be thousands of floaters around for the taking."

"No doubt; but their fuel cells are gone. After the power station was shut down, any portable power sources were cannibalized."

I say, "I would like to talk to those People again."

Don looks as though he might start Tearing his hair, in a restrained sort of way. The Astral Cad throws his hands towards the ceiling and lets them flop.

"Lizzie, do get it into your head that

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M'Clare won't expect you to carry out your Assignment after all the potential subjects have gone."

This of course is perfectly True.

All the same I am damned sure M'Clare would not expect me to spend nine weeks Getting here and then spend most of a week Sitting in a contained environment making no attempt to do anything at all.

I say "You've still got some work to do with the computers at the Space Gate. Drop me wherever you go in. I'll walk round and see if those people are still there. You won't risk losing the floater any more than you'd be doing in any case."

I am *not* going to run my Life on the assumption that anyone I run into is More apt to be dangerous than not, even if I am a girl.

It is a Rule that someone always stays in the Hulk and next day it is the turn of the Astral Cad. Blazer and Don and I set out in the floater. The Route so far as I can tell is different from yesterday's and the last section goes past a sort of fenced-in Park full of enormous Machinery, draped with thick transparent plastic and looking like Ghosts of itself.

Just after this we come to a double Gate in a high concrete wall. I can see the buildings of the Space Gate sticking up behind the wall. The gate is locked.

Don leans over from his seat and says to the gatepost, "Laydon and Weigh to see the Custodian, please."

There is a sudden rasping noise and a voice says quite loudly "Laydon? Laydon, is that you?"

"Yes, sir." says Don. He glances at me sideways and adds "Reporting for duty."

"Good . . . Check Security, Laydon. Suspicious characters. Lurking."

Don gives a quick and Harassed glance around and says "Nobody in sight. Sir."

After which somebody steps round a nearby bush and says gently "Excuse. I have need to speak with the In-Charge."

Two other people step round the bush after him and just Stand.

They are some of the people I met the previous day. I don't recognize them personally, but they have the same range of skin colors and the same sort of clothes.

The voice says "Laydon? Laydon! Report!"

Don swallows and says "Yes, sir. I have to report that three visitors are asking permission to see you."

"Get rid of them," says the voice.

Don and Blazer exchange Looks; then Blazer says in the best imitation of the Astral Cad's voice I have yet heard from him, "Should I ascertain the subject of the visit, Sir? It could be relevant."

The voice says, "If you want to come in today, come now," and something goes *click!* in the door.

Blazer and Don hold a hurried Whisperation and Don mutters to me that I had better come with them, perhaps.

I say No, when shall I come back to meet them here?

"Three hours," says Blazer, before Don can argue; and shoves open the two parts of the gate. The three people come out from behind the bush again, but the door opens just enough to allow the Floater inside and closes around its back end without ever leaving space for them to get through.

I say "I am sorry." Which is true,

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and I think the In-charge or Custodian or whatever he calls himself has lousy manners, I suppose he is afraid of Hijacking but he could at least have refused politely.

By the time I get to the place where I met the People yesterday I am good and sick of the smell of Burned wood, and I could do without setting eyes on anything Black again for a year or two, and when I find the place where the Lander flattened out the Lawn there is nobody there.

While I am wondering where to Look I feel something Poke the back of my arm.

I turn fast and don't see anything for a moment; then I look down and there is one of the little People looking up at me about six feet away.

Correction, there are three of them. No, five . . .

I am just not Used to being Waist-high in human beings. . . . Okay, I know about Kids, but I never met this many all at one time.

I do not know whether to Pat their heads, or what.

Seems they have their own Ideas, a couple of them get hold of each hand and start to Pull, and we all set off the way that I came.

We seem to be about to Plunge into the nearest cluster of burned-over Huts when it moves into Focus and I realize it is not Huts at all but a Ship.

I never saw anything like it, not even in a Museum, probably because it is too big; I am told later the Ground plan covers about an acre and a half, and most of it is three decks high.

The Height I suppose should have told me straight off it was not a mass of Huts, but it is black all over; anyway whatever the Reasons the fact is I didn't see it till now when it suddenly Looms above and the Shock nearly knocks me over.

There is an enormous oblong Gape in the metal wall and we have arrived in front of this. The children Swarm round me and the tallest girl calls something I don't understand; and a moment later the Elderly lady who spoke to me yesterday appears from round an outside corner and says "You are welcome."

I say "Thank you."

After this there does not seem anything else to say; I meant to start with Apologies for having been so Rudely kidnapped in the middle of a conversation but I am not sure this would be understood.

She comes to a conclusion and says "We will go on the grass." After which she proceeds towards the Lawn at a brisk toddle, calling something in the strange language as she goes.

A moment after we reach the grass the three tallest girls arrive panting, two carrying folding stools and the third a woven mat. They put the mat on the grass and the stools on the mat, Bob up and down a little with one knee bent, and run away.

The old lady says "Sit," and we do.

The Instructions for interviewing possible informants say Let *them* set the style of conversation, especially where you do not know local manners and customs, which God knows I don't; that is, I have had some Briefing about it where the average Figueroan is concerned but these people are evidently Something Else.

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However when we have been silent five minutes or so I say "Has your ship been on this planet long?"

The old lady thinks this over and says "Too long."

At first I suspect this is a Snub but after another minute or two during which I think she is doing some Translation she says "Nine days."

Now I suppose it is My turn and she already knows that I arrived yesterday, so I say, "My friends have been here for three weeks."

She blinks slowly and says "Your friends talk to the In-Charge."

The people at the Gate must have been wearing Radios. I say, "The In-Charge has allowed them to use the Space Gate computers"

Suddenly all the creases on her face fold shut and she looks Furious. She says "Chief has asked to talk to the In-Charge. The In-Charge says No!"

I say, "I know he did, but I do not know why."

"Four time," says the old lady. "Chief begs the In-Charge for appointment. *Four* time."

I say, "When I came here I did not know the people of the planet had gone away. Other planets have not been informed."

The old lady nods sharply.

"*No* informing. *Msilikatse* in orbit, the In-Charge does not inform. Chief says, Okay to land? The In-Charge says, okay to land. Permission granted. No inform! *Msilikatse* lands. No Customs. No Immigration. Nothing."

What the hell was the In-Charge, I mean the Custodian, trying to do? It does not make Sense. Bringing that enormous ship down on an empty planet . . .

When he saw it I bet he was scared Stiff, which might explain how he is Behaving now.

I say, "You have a very large Ship."

The old lady looks sharply at me and I suspect she knows what I am thinking. She says "Hero class, rated for three hundred active, seven-fifty narcotized."

I feel as though History opened a large dark Mouth and Yawned at me. Hero Class ships were built six or more Centuries ago, for the second wave of Colonization; ferrying people from the Central Stars out to the next batch of newly-terraformed Worlds. When the ferrying was over they were cut up for Construction materials; nowadays even the Constructions have mostly been melted down for scrap.

They were not built to land on planets at all; but I suppose if you fitted one with large enough Antigravs and came down slowly, the heating and Aerodynamic problems could be overcome. It would certainly take a Hell of a wind to push that Monster off course.

I say, "I never saw one before."

The old lady says "Come." She gets up and toddles briskly back towards the Ship.

Being shown over that Enormous iron City is no doubt an Experience, but there are several moments when I could do without it. For one thing, I can hardly See; the old lady has not switched on any lights but carries a Lamp, and every five minutes or so it flickers and she turns it off for a moment; till the Fuel cell revives I suppose, but I am never perfectly certain it will Do so.

All the hatches and air locks are wide

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open, so there are sudden patches of Daylight. The chief impression is of Size and Decrepitude and the thought of people going to Space in the thing makes me Cold all through.

When we finally get outside I thank the old lady for a most Interesting tour and take several deep breaths; despite the open hatches the ship smells Musty. Actually I suppose they have just shut down the Auxiliary power supply for Maintenance or Repairs; with the Life Support systems running maybe it is more Homelike.

I then look at my chrono and discover it is High time to go.

I did not try to Question the old lady during my Sightseeing Tour; she might think it Bad Manners which would mean it was Bad Technique; but she did mention some things in passing, and on the way to meet Don and Blazer I try to sort out what I learned.

Viz;

Msilikatse and her people come from a place called Yeji-Dagomba.

The people of Yeji-Dagomba, or some of them, have a Tradition of long voyages; a whole Tribe or Sept or Kinship or what have you will take ship together and make the rounds of half a dozen planets, setting down for half a year or a year to work—all Planets in the Outer Reaches are short of manpower for big Construction jobs and such—taking most of their pay in local Products, to be Traded at later ports of call. They get home ten or twelve years later, increasing the Planetary stock of Wealth and Experience and bringing a few dozen kids to get acquainted with the home World.

This current voyage has lasted more than ten years and they are on their way Home. They have about three weeks' journey to go.

When I get in sight of the Gate I find it is shut, with the Floater already outside. Blazer is sitting at the wheel but Don is standing beside it talking to one of the three People, probably Chief.

I slow down and start to catch my Breath. Blazer is looking cross, Don as usual looks Worried and Responsible and Wishing he knew what to do for the best. As I get within earshot he says "I can't promise anything. Tomorrow I will ask to speak to the Cus—the In-Charge. I will tell him your problem if he allows me to. I can't do any more than that."

Chief puts his hands together and makes a little bow and says "I thank you."

Don makes a sort of Not-at-all gesture and climbs into the floater and Blazer yells, "Hurry up, Liz!" As I reach the floater he says, "I've just been told that we picked you up within a hundred meters of a Hero Class transporter and never noticed it was there."

He sounds Disgusted, Disbelieving, and Disgruntled. I say, "I've just been shown over it."

"This I have to see," says the Blazer, and the Floater screams off before I am properly inside and nearly throws me Out again. I sit up and yell to Slow Down, there are Children around.

However he slows down of his own accord as the ship comes in sight and Edges up to the metal walls as though he has gone shy . . .

The Ship is made up of broad rectan-

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gular Bays alternating with deep narrow niches. That method of construction has not been used for several Centuries but it is the Metal which really shows that the ship is *old*. It has been struck by Micrometeorites so many times that there are Pits overlapping Pits, with Knobs between. It has been covered with Black-body paint so often the Knobs have a cap of it several millimetres thick, but the latest coat has a fair collection of new bright Pin-pricks and scratches already.

Blazer moves the Floater past a couple of bays at Minimum Cruising Speed, then before we reach any of the open Hatches he whirls it round and streaks for Home.

We pass the three People sitting patiently under their bush; Blazer does at least swing wide enough not to Blow their clothes off but otherwise his driving is completely Hog. We shoot past the compound full of machinery and arrive among streets of houses without, so far as I can see, going through the usual Twists and turns, and finally slam into the Hulk when the door is just barely open, and Flounce to a stop just short of the far wall.

When we troop into the main Living Area the Astral Cad is trying to sit on the back of his neck in a Chair not designed for it, and resting his heels on the back of another; he remarks to the air, "Judging by the way you rattled the furniture, I gather the old man has finally gone off his head."

"Never on it," grunts Blazer Weigh.

Don heaves a sigh up from the Bottom of his chest and says, "Yes. I suppose so."

I say, "Why? What has he done?"

Blazer has dropped into a chair, trying to imitate the Cad's posture, but as there is no second chair within reach he has to haul himself up and just plain Sit. He says "Oh, he only switched the Radio Relay Satellite off, that's all."

The Cad is so Moved his heels slip off the chair-back and he also bounces into a normal position. He says "Why?"

"Usual reason."

"Oh." The Cad turns towards me with exaggerated grace. "This will interest you, Liz my dear. It's a pity you can't interview our friend the Custodian, who is, after all, the one Inhabitant of this planet that we know of who has remained within reach; he has definite views on the subject of your Assignment. Very definite."

I had just about forgotten my Assignment; it takes me a moment to say, "The Independent Firsters?"

Don has sat down, still frowning heavily. He looks up and says, "He's using them as an excuse."

I say, "What for?"

"Oh, for shutting down every facility on this benighted planet," says the Astral Cad.

Don says, "He claims he's custodian, of all the Corporation's property on Figueroa, and he claims to believe the Original Firsters are going to try to take it over, now everybody else is gone."

Blazer says "Actually the Relay Satellite isn't Corporation property; it was installed before they took over."

"They've maintained and repaired it," says Don. "Legalistic arguments aren't apt to get us anywhere."

"Especially," says the Cad, "since the old lunatic is no more official Cus-

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todian than I am. He just took the chance to grab power when all his seniors pulled out."

Don sighs again. "We don't *know* that. He does have the keys and the computer codes . . . which makes the question of his appointment irrelevant."

I say, "How does shutting down the Relay Satellite help to keep other people from taking it over? The controls are on the planet, aren't they?"

Blazer says "I told you, he's mad."

"Only nor'-nor'-west, in this case," says the Cad. "Shutting down the Relay Satellite reduces the chance of interference from outside. Distress calls aren't likely to get through the ionosphere to be picked up by passing ships, for instance."

I say "What about the people from the old Ship?"

They all speak at once. I think Don says "Oh, hell, yes," the Cad says, "*What* old Ship?" and Blazer says, "*What* about them?" and then immediately begins to tell the Cad about the Hero Class Ship. The Cad listens with an expression of patient bewilderment and finally says, "Yes, yes, very exciting, but what has this got to do with the Relay Satellite?"

I say, "I think the people were in Distress."

Don says, "Yes, poor devils. I promised to help if I could, but I doubt very much—"

"Oh, Stars," says the Astral Cad. "Our Worthy Leader in his pose as Protector of the Poor, encouraged therein by our latest recruit in *her* pose as Little Friend of All the World. Get thee behind me, Pollyanna, and *don't* push."

I say, "What did the Chief want to see the In-Charge so badly for?"

"He needs fuel for his auxiliary generator, and—"

Blazer says "*Fuel?* The Hero Class have *four* proton monopiles—"

"This is for the life-support system," says Don.

"The power for that is drawn off one of the monopiles."

Trust Blazer to know that.

"Yes, I *know*. The Chief Engineer told me all that. Trouble is, the connection between the monopile and the life-support power system has broken down somehow—damn it, the thing's six hundred years old. To get the ship home he's got to use an auxiliary power supply. The only one available runs by oxidizing some chemical or other. He says there ought to be a supply of it here. That's why the ship put down. They can't take off again till they've got some."

Blazer is frowning. "Could be bradynitro, I suppose. That's used for—"

"Does it matter?" enquires the Cad wearily. "I take it we haven't got access to any. I take it the self-styled Custodian does have it. I take it your self-imposed duty is to persuade the old loonie to part with some of it and I wish you luck, I really do. Now can we talk about something else?"

However, the Blazer's interest in Machinery apparently outweighs even the influence of his Friend and Model. He continues to speculate on the Fuel required for *Msilikatse*, and its possible uses around the Space Gate, until the Astral Cad rises in a Marked manner and drifts out of the room.

* * *

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Next day Don agrees I can travel with him to the Space Gate and take the floater on to *Msilikatse*. I want to talk to the old lady again if she will let me. Don does a bit of rather half-hearted Dodging—I think everybody has lost Faith in possible predatory Watchers—and the route takes us past the Machine Park again. I get the impression out of the corner of my eye that one of the upstanding Crane-type things moves as we go past; I suppose the Custodian(?) is amusing himself with the Remote controls.

I think Don was expecting, perhaps hoping, Not to be allowed in any more, but when he mutters to the speaker in the Gatepost the valves of the door move open.

When Don is inside and the gates shut I back the Floater and find the Chief Engineer standing there, with only one attendant this time.

He says, "Your friend has gone to see the In-Charge."

I say, "Yes. He wants to ask him about fuel for your generator."

The Chief says, "He is a good man."

It occurs to me this is probably True. I wrote Don Laydon off as a Stuffed Shirt the first time I met him but under present Conditions he is showing up rather well.

When I reach *Msilikatse* there seems to be No one around; I walk along the side of the ship till I come to one of the open hatches and hear faintly a kind of Groaning somewhere inside.

It does not sound quite like somebody being Ill but it is a good enough Excuse for going in to see.

After fifty meters or so I realize it would have to be an Enormous somebody to make as much noise as this and after another twenty the Deck is shaking under my feet, finally I arrive at a glass door with the Noise coming from the other side.

There is light in there but it is faint and Flickering, all I can make out is a row of people standing with their backs to me and Stamping their feet up and down.

Then they all stand back a pace and four others jump in front of them and start Stamping instead. After a moment the lights go brighter and I see the four who have been replaced are dripping with Sweat; one of them turns towards the glass door and sees me Standing there.

He turns back and I suppose Says something, because a moment later the old lady comes into view and opens the door.

She is scowling and says, "Eh! Girl. Why you come spying like this?"

I say "Sorry. I heard the noise and thought somebody might be ill. I'll go."

Fortunately she thinks this is Funny, she bursts out laughing and turns to yell something to the others, who also start laughing and calling out in their own language; after a moment a man in overalls appears waving a big oil-can and says something to me which is plainly a Joke, but I don't understand.

The old lady gives him a playful Clout on the rear and explains "He say the Machine old and get Rheumatic like me."

All this time the new four are solemnly stamping up and down and I can now see that they are treading down Steps on a kind of rolling cylinder. The

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man with the oil-can goes back to work on it and after a bit one of the components in the Noise dies away. There are a lot of yellow-looking Plants around.

Suddenly I realize what all this is About.

Okay, I have heard of Treadmill generators, some of the remotest Communities on Excenus 23 have one as an Emergency standby; what shocks me is not the Idea itself but that anybody should have to use human labor to make electricity to make light to run Hydroponics on a *Space ship* of all places.

Besides, what Good can it be? Energy usage is never 100% efficient. They must use up a lot more Calories to make the light than the plants can possibly store as Starch; and they must generate more CO^2 than can be absorbed.

The old lady says, "Fuel is for Power. We get power ourselves also."

I say "Enough for a *voyage?*"

She thinks for a moment and then says, "Re-charge-able stor-age ac-cum-u-lat-ors."

Oh.

But surely to store enough Life Support Power for a three-week voyage will take months and months, even if they run all systems at a minimum level. Even if the Treadmill is kept going by relays of people who run themselves to exhaustion, which they seem to be doing—

Right then, in fact, somebody steps Backwards off it, swaying. Somebody else replaces him before the Treadmill's note has time to alter, while he takes two more steps and Crumples quietly to the floor.

Nobody seems surprised, let alone Dismayed; two women are bending over him feeling his Chest, then they carry him briskly to a Mat in the open hatch and lay him out on it.

I say, "Does that happen often?"

Which I guess was Tactless, anyway the result is a Resounding silence and the old lady goes over to take a look at the Collapsed man.

I decide to take a quick look around. . . . Behind the Treadmill I come on four men sitting in a row, with big helmets over their heads like the hood of a Library style Reading machine.

Beside them is a control panel with the usual Dials and things. I am still looking at that when the four men get up and change places with the ones on the Treadmill. Four others move under the helmets and sit down.

On some of the dials the needles are in the Red.

There is a touch on my arm and I find the old lady beside me. She says, "The Manpower is set for mean average response."

I say, "Is that safe?"

She blinks at me and repeats, "It is Mean Average."

Before I can answer—anyway I cannot think of what to say—the old lady gives a little jump and her eyes widen; then she cries, "The Chief will speak with the In-charge!"

There is an immediate Buzz and everybody except the four Stampers and the man with the oil can gathers round her, talking.

If Don has been successful in his Mission he will be wanting the Floater shortly; I tell the old lady I must go back to him. When I reach the Floater I find that she has come too.

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Well, Why not? She climbs in beside me, shouts Negatives at the crowd of children who want to come for the ride, and I drive away.

As we approach the gateway we can hear Voices; the old lady puts a hand on my arm and points to a place where the floater would be Hidden from the gateway by a bulge in the wall. I park it there and we walk on, quietly.

The gate is open just enough for one man to stand in the opening, and he is doing so. The In-Charge, I presume; but I did *not* imagine he would be a cherubic little man with curly hair combed down with water so that it looks like a Baby's; or that he would be looking so remarkably Pleased with himself.

Then I see Don standing just behind him, unable to pass, and not looking Pleased at all.

The In-Charge is saying, "Two thousand liters? You said two thousand liters, is that right?"

The Chief says, very carefully, "Two thousand liters. That is correct."

"Oh, yes," says the In-Charge happily, "we could supply ten times that amount. Pump, or in drums?"

The Chief says, "We will take it from your pump. We have transporter."

"Good. Good. Excellent. Now. How do you propose to pay for it?"

He is Twinkling all over with enjoyment. Don looks thunderous.

Interstellar payments are tricky, especially here in the Outer reaches. But, damnit, the People must have been prepared to pay the stuff when they put down here . . .

"We have guaranteed drafts on Banks of Latimer, Garuda, Mercutio, Rosemary."

Rosemary should be foolproof, at least, as one of the Three Sponsoring Planets—

"Sorry," twinkles the In-Charge, "no banking facilities here at the moment."

Stars!

The Chief look perfectly impassive; but he has come to a Halt. Then he says, "we have also Dagomba scrip—"

"Never heard of the place," says the In-Charge happily.

"We have also scrip from New Nassau."

Another of the Sponsoring Planets, surely that will do it—?

"My dear fellow," says the In-charge, switching suddenly to pathos, "whatever use is that going to be *here?*

"You could keep it and hand it over to the Corporation," says Don abruptly from behind him. The In-Charge throws a look of Venom and vinegar over his shoulder and says, "At the moment liquid assets are liable to be confiscated. Bankruptcy proceedings. I'm afraid that won't do."

During this the Chief's back, which was straight to begin with, has been getting even Straighter. He now says, one word at a time, "We carry trade goods. Also cargo."

"No market for them now, I'm afraid," says the In-Charge with undiminished cheerfulness. "It looks as though we can't do business. A pity."

The old lady has been silently Fermenting beside me; now she steps forward and screams something which is obviously a Curse, and the In-Charge jumps backwards and loses his Smile.

"Get that woman out of here!" he exclaims.

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"Why?" says Don. "She isn't on Corporation ground. It presumably belongs to their creditors in any case. In fact as Custodian you should be considering the interests of the creditors, not—"

"Get out!" yells the In-Charge. "Traitor! Ungrateful! Get out! Go!"

"Get out of the way, then," says Don, and grabs him by both shoulders and Spins him backwards out of the doorway. He dives through himself just as the valves clang Shut.

I do not want to look at the Chief or the old lady. I can't help seeing Don who is standing with his Back to the gates and his head Up in what looks like an attitude of Noble Defiance, a lot too late. For some reason the In-Charge has deliberately and elaborately humiliated all of them and it makes me feel Apologetic about also belonging to the Human Race.

What I want is to get right Away from everybody for a bit, so I walk round behind the Chief and his Attendant and go on walking. They don't notice me and neither does the old lady; I don't know about Don. As I go I hear the Chief say, "I thank you, sir."

Don answers, "You have nothing to thank me for. I haven't helped you at all."

The old lady says, "You *try*."

I wish the In-Charge was here so I could kick him; what Makes anybody behave like that, Mad or not? I would offer to pay for the Fuel myself, but I suppose his excuses would work just as well against my Universal Credit Card. . . . I wonder how hard it would be to break in and Steal the stuff, but I don't know where it is, and I don't suppose Don does either.

There is a sudden Shout from up ahead and a sort of clanking and creaking noise. I look up and one of the Cybercranes from the Machine Park is just stepping over the fence, waving its shovel-head to and fro on the end of a Neck ten metres long.

The telescopic legs seem to move slowly but they are so long that they cover a lot of ground. It takes a Stride away from the fence. The head does one side-to-side traverse, Dithers for a moment, then settles down pointing straight at me. The left front leg and the right back leg Telescope up, swing, and come down, having moved the Crane several meters closer to me.

I don't know what the Hell this means but I think it is time to Run. I turn to do so and there are a whole bunch of the Kids from *Msilikatse*, I suppose they have Followed me.

I yell "*Shoo! Run!!*" and make appropriate Gestures; then I turn and Run the other way. Not towards the Crane but Away from the machine park towards a cluster of the burned-over Huts which are about fifty meters away.

I can hear the thing coming after me, shaking the ground every time one of its Legs comes down. Just as I reach the first Hut there is a sort of *Whish!* behind me and I jump sideways and the Shovel-head comes down on the Hut wall and knocks it to splinters.

I dodge in among the Huts, trying to get out of the thing's Line of Sight; which means I can't see where its Head has got to. Then suddenly as I Squeeze between two of the walls there it is right over me; I can see the red gleam of its

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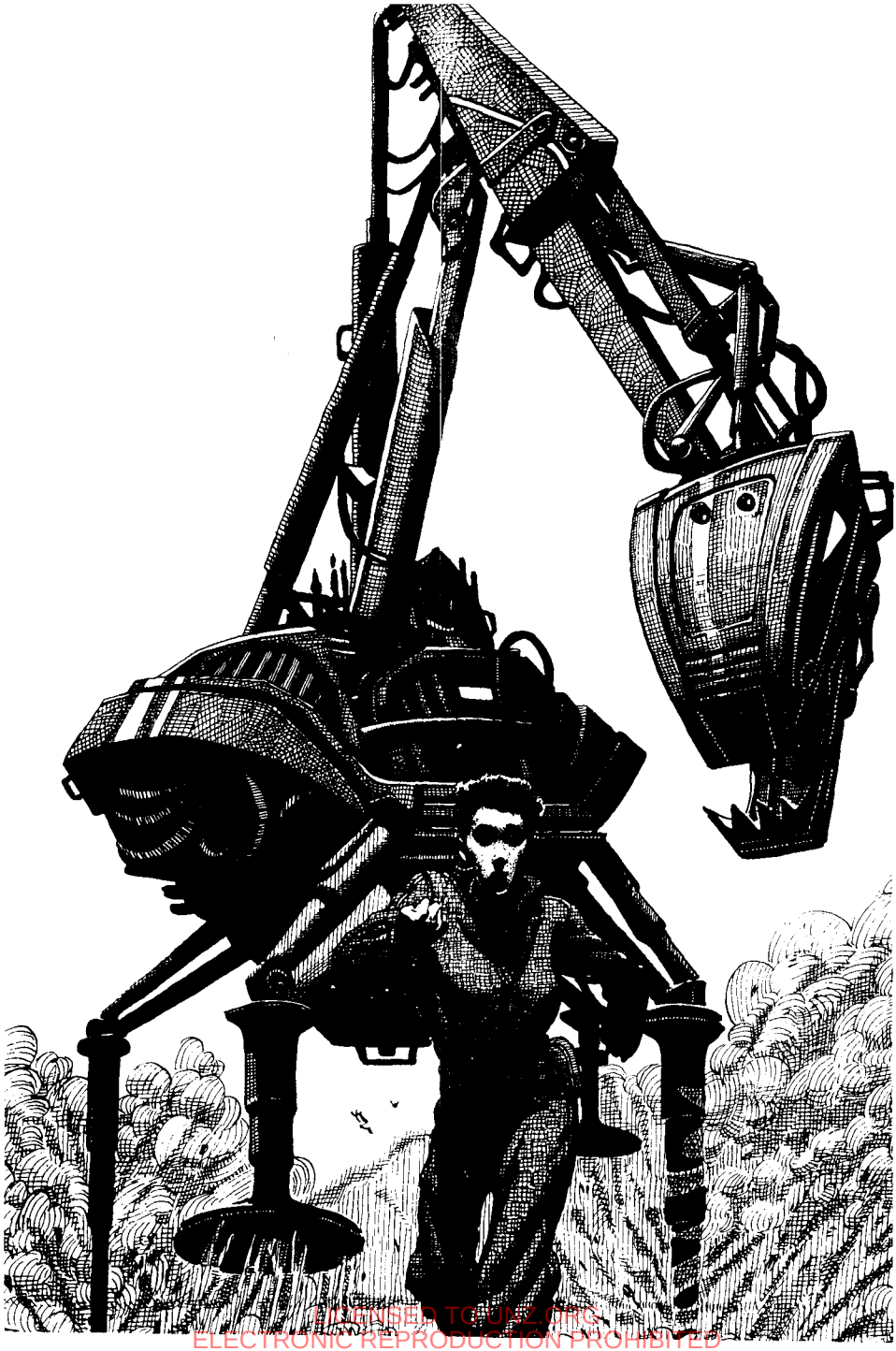

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eyes which means it has got me Registered, and all I can do is dive inside the Hut and hope its brain is not Bright enough to work out where I must have gone.

Some Hope, there is a rending Crash as the roof is knocked sideways and I am left crouched in a corner Staring up at the thing, oh Damn this is a stupid way to die—

The head suddenly jerks back and I hear the sound which means it is Readjusting its legs, I suppose this is where I should Review my past life but all I can think of is, I can't help closing my eyes but I am *not* going to Scream. . . .

Then there is a Flare that burns dazzling white even through my eyelids and a most godawful Bang! and then nothing happens and goes on happening until I realize I am not Dead after all.

Just the same it is quite difficult to get my Eyes open; when I do, all I can see past the broken edges of the roof is the Sky.

I don't know how long I just crouched there Enjoying it, but suddenly there is a lot of Shouting going on and I can hear my name: "Liz! Lizzie! *Liz!. Forgodsake, Liz!*"

I try to get up but my legs don't Feel like it, so I shout "Here!"

This leads to a lot of Trampling and noises as though some of the Huts are being broken down: more Shouts, which I answer; then the Back wall of the hut is suddenly smashed in and Don is falling through the Hole.

He is so covered in Smuts I didn't realize at first that he is bare to the waist; then I see red beads trickling down the Black smudges and realize he is covered in Scratches as well; I don't think my mind is working too well because it does not occur to me to Question this phenomenon until later. Meanwhile Don Lurches to his feet and takes two strides across the Hut floor and Hauls me into his arms.

I don't know how long we remain at an Angle propping one another up and I can't remember a word either of us said, which is probably just as well, but in the end Don gets back to his Senses and pushes me through the hut door to face the Chief and the old lady and three or four others who are waiting outside.

There is some Handshaking and the old lady suddenly darts forwards and Kisses me, then we all go to look at the Cybercrane which is standing on its two front legs with the hind ones flat on the ground, and its jib bent backwards at an angle with what is left of the Shovel pointing straight up at the sky.

Some of the Shovel has melted and is hanging down in Blobs, and there is more Melting at several points on the Jib and a big hole where it joins the Body of the thing.

Something has happened so that everything around me seems to be wrapped in Invisible padding about two inches thick; it takes Time for ideas to get through; but I gradually realize everybody is waiting for me to Comment on the thing.

I say, "How did you Stop it?" and then, "What made it Start?"

Don says, "This is the man who stopped it; Second Engineer Emmanuel. He managed to short the power-pack through the thing's brain, just in time."

Second Engineer Emmanuel seems to have gotten rather Battered in the

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process, his arm is in a rough Sling and half his face is puffed up round a big patch of dried blood.

I feel around in the Padding to find out what I ought to be doing, and say, "Thank you very much."

He shuffles his feet about and grins, showing a missing tooth on the Puffed side. Then the old lady pokes him and says something sharp, and he shuffles again and mutters, "Is nothing, Miss Sir." Don has a grip on my Elbow which indicates something Not to be said right now, so I do not repeat the rest of my question.

There is a lot of talking in what I suppose is Dagomba language; it begins to seem to me as if it is going on for Ever, and then suddenly we are all walking back towards the Floater. Then I see the Gate open and the In-Charge appears, shouting, "I told you they were thieves! I said they were all thieves!"

Things stop for just a heartbeat, before everybody starts for him at a Run and he disappears inside and the Gate slams shut.

Some kids have appeared from Nowhere, the way this lot does. One of them is carrying Don's tunic. He puts it on, wincing as it goes over his scratches, and I ask what he took it Off for.

"It got caught in the gate," says Don irritably.

So when I thought he was Posing he was just Stuck, maybe I ought to Apologize.

When we return to the Hulk our colleagues are lounging in the Lounge, but our Entrance causes them to sit up sharply and then Rise simultaneously to their feet.

I think the Cad is searching for an Epigram when Blazer Weigh exclaims, "Forgodsake, what *happened* to you two?"

We stopped at *Msilikatse* and some of the children brought us water and towels and soap and a comb, and our clothes are Evercleans and all the Dirt has shaken off them long ago; but I can feel from inside that there is something wrong with my Face and the Padding stops me from getting in touch with my Muscles so as to put it right.

Don shoves me gently into a chair and drops into one himself and says, "Give me five minutes' peace and something to drink, and I'll explain."

Blazer goes over to the Dispenser. The Cad has just thought of a Remark when Don says, "Leave Lizzie alone. She's getting over a shock. Just over an hour ago she was very nearly killed, and it was *not* the result of anything she did herself, so no smart remarks, please."

The Dispenser has never produced anything but Reconstituted fruit juice since I first encountered it, and that's what we get now. Don drinks his slowly, puts down the glass, and says, "All right. . . . You know that yard full of machinery we pass on the way to the Gate? The Custodian has programmed some of the machines to attack people who interfere with them."

There is a blank silence; then Blazer Weigh says, "Crap. Those things don't *have* attack circuits. He can't have done."

Don says, "They respond to objects and movements around the business end. They can move suddenly as well as slowly, over a long distance as well as a short one. . . . I don't know how

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he did it exactly; maybe they have some kind of burglar-alarm circuits and he managed to link those in to the ones that control movement. Anyway, he did it. The Second Engineer from *Msilikatse* was prowling round one of the machines and a cyber-crane next to it started thrashing its jib around. He dodged it and hid, and the thing walked across the compound wall and saw Lizzie with a bunch of kids from *Msilikatse* and started chasing *them*. Lizzie broke away and got it to chase *her* among those burned huts. The Second Engineer managed to climb up on the chassis, somehow, and just before it smashed the hut she was hiding in he succeded in shorting the auxiliary power cell. It blew with enough of a bang to fuse all the brain centers and knock the thing over backwards."

So that's what happened. . . .

Blazer Weigh says, "How the hell did he manage that?"

"Never mind," says Don severely. "The point is, the old man's paranoia is dangerous. He got it into his head that someone was going to try to steal the machines—"

"It sounds as though he was right," says the Astral Cad.

"The man wanted to see if the power cells were removable. The Chief Engineer was perfectly willing to pay for the fuel he wanted, or any other usable power source; but he suspected the old brute wouldn't let him, and he was right."

"I don't see what good the power cells could have been," drawls the Cad. "They don't run on bradynitro."

"They could be used to recharge storage batteries. I gather *Msilikatse* has a big stock—enough to run the Life Support system all the way home."

"Oh," says the Astral Cad thoughtfully.

I have a feeling I ought to Say something at this point, but the Padding is still getting in the way.

Maybe I make some sort of Noise, because Don looks across at me.

"Lizzie, you look terrible. Why don't you go to your cabin and Sleep it off?"

I can't even manage to Resent the suggestion; I just Go.

I don't know how long I slept because I don't know what time in the afternoon I went to sleep, but when I wake up it is Breakfast time, the padding sensation has gone, and even that reconstituted Glop that the robokitchen turns out at this time of day smells attractive. I shower and dress in a hurry and join my Colleagues around the table.

Breakfast in the Hulk is never a Sparkling occasion, this morning it is extra Glum which I attribute to the events of Yesterday as described by Don to the other two. I stoke up pretty quickly—one thing about Reconstituted food, you can swallow it fast—and enquire whether anyone else is going out to the Space Gate this morning.

This produces a sort of Tripartite explosion of toast crumbs, then for once it is Don who finds the words first.

"Forgodsake, Lizzie! What's the point of going there? What do you think you can do? Or the rest of us, if it comes to that."

Would you believe it, just for a moment I have completely forgotten what it is I have to do; I woke up remembering there was *something*, not *what* . . .

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However, the Cad sticks his oar in before I have time to Reveal this.

"Speaking for myself, No. We have gathered every last available statistic that could conceivably have any value for future work, and—"

I say, "That's It!"

Okay, I don't really Blame them for thinking I have gone mad, and anyway I have no Time to act insulted, I just go on, "It's a statistic that's lethal, when you get down to it. Did you know *Msilikatse* has a Mesmeric Equalizer on board?"

They all have approximately the same Expression on their faces: however Don says "No," Blazer says "Where?" and the Astral Cad says, "What in the name of Sanity is a Mesmeric Equalizer?"

Blazer Weigh says, "They were used quite a bit a couple of Centuries ago. Mostly in the Outer Reaches, of course. People in the Central Planets would never have stood for them. . . . One of the main elements was an Enforcement Unit—on the same lines as the Concentration Unit in a Reading Machine, but this one was concerned with manual labor. The other was the Equalizer. It worked out the effort required for a given job and then shared it out equally between the group who were to do it."

The Astral Cad enquires wearily "What the hell *for?*"

"Oh, it was designed to simplify industrial relations. The amount of work to be done could be agreed on at the start, and then performance could be enforced; but there were a lot of drawbacks."

"I should damn well think so," said Don. "But what use would a thing like that be on *Msilikatse?*"

I say, "On my home planet it was used another way, once."

How it got to Excenus 23; a bunch of young men from wealthy families decided to come and prove they could make their own Fortunes. One of them was always Fussing because he claimed he worked harder than anyone else, and imported an Equalizer to try and Even things. But the others refused to use it, and soon after they decided to make do with the Fortunes they had inherited, and left the planet.

Then another bunch with *no* Fortunes found a rich seam three weeks before their Lease expired and were frantic to dig out as much as they could. The Equalizer was still where the others had left it and one of them had the bright idea of using it to increase their Work output by taking out the Governor circuit and setting it to enforce Maximum effort the whole time. For nearly a week they were Ladling the stuff out and then one of them fell down dead. No resuscitator nearer than 250 miles, so he stayed that way.

I explain the Relevant part of this and Don says, "You think that's what the people on *Msililkatse* have done?"

I say, "I know it is. I saw the Control board."

"What I don't see," drawls the Astral Cad, "is what Statistics have got to do with it."

Slowly and carefully, I Explain.

"What the Equalizer does is to measure the Working Capacity of each member of the group, then takes the Average. Or Mean. The Controls are set for a percentage of this, usually about 85. The Governor stops it going higher than 90% but if you disconnect that circuit

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it will go to 100 and that's how the one on *Msilikatse* is set."

"In other words," says Don, "the ones whose capacity is a bit below the mean of the group are going to be forced to do More than they can."

"Anybody can manage more than their normal capacity for a bit," says the Blazer, whose liking for Machines seems to impel him to defend every Aspect of them.

I say, "I know that. But forcing people beyond their normal limits is dangerous. Sooner or later they're going too far and somebody will Die of it."

I don't quite know what I expect: not Shock and horror because they would see the punch line Coming, but I do expect *something*.

After a bit Don says heavily, "I expect you're right, Lizzie, but what do you think you can *do?*"

Well, obviously, go and Tell the people on *Msilikatse* that what they are doing is dangerous, and get them to Set the dials back. . . . I say, "I suppose you think they won't Listen."

The Astral Cad straightens a trifle in his chair.

"My dear, dear Liz. You've been studying Cultural Engineering for two years, and you can still think there's any probability they *will* listen?"

This is Not the end of the argument but I finally wear them down. Blazer Weigh gives me a rundown on the controls of the Floater and I set off.

There is no sign of militant Machines or the In-Charge or any other Enemy around *Msilikatse;* only some Children, who appear Pleased and excited to see me and run for the old lady, who for some reason Bows and starts thanking me. I eventally grasp that this is because I led the Cybercrane away from the children yesterday and she thinks this was somehow Heroic, which was not the case. I would have been no safer if I had run in among them.

I try to explain that I just ran towards the Huts because there was nowhere else to hide. But not very hard, because it occurs to me they may Listen more if they go on thinking like that. I ask to speak to Chief and am conducted to him, sitting on a folding chair alongside the main hatch. There are several people lying on Mats, two of them women.

Chief rises and bows to me and the children bring a chair. I explain very carefully why I have come and he Listens very carefully and says nothing for a long time. One of the people lying down calls something and a woman comes out and spreads a blanket over him.

Finally Chief says "You are good to be concerned. This thing I know. The power-wheel has been not used for many-many years, never in my time of voyage, but I was told by the Chief before me. But now we need power to leave this planet."

I say, "But you only need to set the dial back five percent and it will be safe enough!"

He says, "Five percent means one day in twenty. To recharge the accumulators will take forty days. Five percent is two days. All days on this planet are danger for *Msilikatse* people."

I cannot Argue with that.

I say, "I wish I could get fuel for you. I wish I could help."

He says, "Already you are our friend."

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When I start to leave I am mobbed by the Children who take me to see the Old Lady, I want to say Goodbye to her anyway. We exchange a few rather Ceremonious words and I mention I would like to see the Second Engineer to thank him for saving my life yesterday; however I gather he has gone into the remains of the Town with two other men to look for some Wiring and stuff. I ask just how he put that Thing out of action yesterday; apparently she does not Hear but the children do and start to Giggle into their hands.

When I have said Goodbye they grab me and pretend to be showing me the new Plants being grown for the Hydroponics section. What they really want is to rub dirt on my Evercleans when I am not looking and watch it Fall off, seems some of them saw this yesterday and the others will not Believe until shown. I ask them how Second Engineer Emmanuel managed to blow up the Cybercrane and they giggle a lot more, finally the eldest girl whispers in my ear, "Second Engineer break open the engine box and Piss inside!" and I say Goodbye in a positive Explosion of giggles, and drive away.

Damn lucky for me he thought of it, anyway.

I am half way back to the Hulk when something on the control board comes to life with a sort of Pop, and Blazer Weigh's voice Yells at me, "Lizzie! If you copy, say so!"

I say, "I copy, where's the Volume control?"

"Never mind," he yells back. "Take the next turning Right and then Left and then Report."

I turn Right and then Left, which Heads me back towards the Gate, and say I have done so.

"Good. Now Right at the garden with the big pine tree, and third Left after that."

Now I am headed for the Hulk by a track parallel to the usual one.

"Okay. Look at the control board. See a switch colored green? When the moment comes, slam that down and jam the accelerator full on, understand?"

I say, "Understood."

"The Hulk's under siege, we think."

For a moment I take this to be more Instructions, then I realize what he has said. I say, "Does the Moment come when I contact the Besiegers?"

"Hope not. With any luck you'll have dodged them. If you do see any just barge through and the anticrash field will shove them sideways. No, the moment comes when—"

At that instant I *do* see the Besiegers, or anyway three men with what look like Stunners; I shove the accelerator home and bang the Hooter and the floater Charges through them and a moment later Blazer yells, "*Now!*" and I throw the Green switch—the Accelerator is jammed on already—and something Snaps round the whole of my body leaving just a small opening for my Nose. There is a Swooping sensation and a *Crash!* and I get the impression of being Compressed into a container much too small for me, and then the goddamn Safety Cocoon shrinks back into the seat of the Floater and I can see where I am.

Which is inside somebody's House after a Hurricane, furniture in Bits

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blown into the corners, pictures hanging askew . . .

The Camouflage room in the Hulk.

The Floater has come through the Main Hatch at full acceleration and Stopped with its nose three feet from the back wall and I can't understand why I am not Dead.

Then Don bursts through the door and states at the top of his voice that I am Not, not even Stunned, not a Scratch on me, I do not feel so sure of this myself but I suppose he would know.

I get out while he is babbling about Crash Cocoons and Energy Absorption Fields and Automatic Homing, and take a look at the Floater. The front end has been kind of Consolidated for about six inches which may or may not mean it will never Float again.

Then it occurs to me to ask Who the hell is besieging us, and Why.

"Come into the Control Room," says Don.

I hadn't realized this place was still Functioning at all, but Blazer and the Cad are inside bending over various installations and a series of screens are lit up, showing Trees and houses in various directions but nothing else I can make out.

The Cad says, "The Enemy have gone to ground."

I say, "Who *are* the Enemy?"

"Oh, there you are," says Blazer Weigh, Fiddling with some knobs.

"Lizzie, dear," says the Cad, "prepare for a delightful surprise. The Enemy, as you ungratefully call them, are the subject of your Field Work Assignment, the Independent Firsters in person."

"Listen," says Blazer Weigh.

"You Terrans in the old ship," blares the Recorder he has been adjusting. "You're surrounded. Show sense and you won't get hurt, not by us anyway. What's on this planet belongs to the people of this planet, the ones who got here by their own efforts and been working all along to make a place for themselves and their children. You got a lot of stuff in there that we reckon is rightly ours. There's been a damn sight too much taken out of Figueroa for the benefit of outsiders and we reckon something's owed to us for that. You're getting picked up tomorrow or day after, we don't want to interfere with that, but we aim to see nothing else goes off planet and we're staying here until you've gone to see that it don't. We know there's one of you out in a floater. When we take posession of it we'll let him in to join the rest of you. Signing off, acknowledge please."

"Plainly an optimist," says the Astral Cad. "Though I think we might acknowledge reception now that we have Lizzie back among us."

Before anyone can Do so another Speaker comes abruptly to life.

"That wasn't so damn smart," it says. The voice is a different one, gruffer, and not making any attempt to sound Reasonable. "If you banged up that Floater we just might decide to take it out of your hides, before we let you go."

Before anyone can Intervene, the Astral Cad has flipped the Switch of an Outside Speaker and retorted "And we just might decide to fix a few Booby traps, or arrange to Blow this Installation, before we depart!"

There is a Yell of rage from the in-

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sider Speaker, cut off suddenly as though someone out there had thrown a switch. Blazer Weigh has already thrown the one inside, and he stands silently while Don and I combine to tell the Astral Cad what we think of him.

I get tired of it sooner than Don, who has been Putting up with the Cad three weeks longer than me. I switch on the radio, while Don is pausing to think of another Insult, and speak.

"You Figueroans out there. What are you talking about? We aren't going to take any of this equipment with us. We don't want to, and we couldn't anyway, it's too heavy."

There is a Pause, during which I hear someone saying "Damnit, that's a girl!" and then the first Voice speaks again.

"Your friends at the Space Gate could, and they're not going to. We need that monopile as much as they do, and it's staying where it is."

Blazer Weigh leans over and switches off our radio, and I hear Shouting start a moment before somebody outside switches theirs off too.

"How the hell did they get to know about that?" he says.

When I have time I will get together and Kick myself for not realizing that the existence of Light and Automatic gadgets and so on in the Hulk *have* to mean that it has an Independent power supply. I have gotten too used to Large-scale Utilities, two years ago it would never have occurred to me that it worked by anything Else.

I will add an extra Kick for not thinking that *any* sort of Power supply could be tapped to recharge *Msilikatse*'s accumulators.

Don says, "What could have made them think we had any idea of transferring the pile to *Msilikatse?*"

"It's a crazy idea," says Blazer. "The pile's over a century old, and if we tried to shift it the casing would probably crack. Let alone it weighs over three tonnes and we've no transport that would take it."

Don says thoughtfully, "You and Van Hatton went outside together this morning. What did you talk about?"

"There was nobody around," says Blazer Weigh quickly. "We checked before we went out."

Don looks at the Cad, who shrugs.

"I forget the exact words. We discussed the Dagombans' problems and Lizzie's overreaction to them. I seem to remember saying that if it happened to occur to Lizzie that The Hulk had its own power supply she would infallibly decide that their need was greater than ours, and demand that we disconnect it and carry it along to the Space Gate and hand it over. . . . Your eavesdropper, if any, didn't know a joke when he heard one."

"I don't imagine that the average Firster has much acquaintance with monopolies," says Don coldly. "Nor do I feel he was to be blamed for failing to recognize your humor as such. However, that seems to explain the present situation. . . . Just *let it go*, Lizzie, discussing Van Hatton's mental peculiarities won't improve them, and we've got other things to think about."

Which is obviously True, but at the end of about ninety minutes' loud and acrimonious Thinking we are left with the following Facts: *One*. If the Firsters choose to keep us In we have no safe way to get Out. *Two*. *Pedagogue* is due

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any time after twelve hours from now. She will presumably drop a Lander. This will have to be some way off because of the Trees and we have to get out of the Hulk in order to make rendezvous.

What I think we ought to do is Call the Firsters again and try to convince them that (a) we have no plans to remove the Monopile or other equipment (b) the Cad's remark about Boobytraps was spoken through the top of his Head and got tangled in his Hair.

Don gets to his feet.

"Look," he says, "we don't want to leave The Hulk until *Pedagogue* gets here. So far as I can see, there's nothing we can usefully say to the Firsters before that, so forgodsake let's have an end to all this talking and concentrate on getting all the data ready to take with us. Pack it so that it can be easily carried if we have to run for it. You two do it, Lizzie isn't familiar with the material. I'm going to make out my final Report."

However when the Precious Pair have departed he does not get out his styler but slumps down in his chair with his chin on his chest and his eyes shut.

I am damn certain *he* realized that our pile could have juiced up *Msilikatse's* accumulators and didn't choose to say; What do my colleagues take me for? But I suppose there is no point in raising the matter; we can't even tell them about the pile over the radio without touching off a War between them and the Firsters now.

I am sitting there Repressing some very good Remarks when Don makes a sound that could possibly be classified as a Laugh.

"Lizzie, do you remember what people said about Figueroa when it was first discovered? Bonanza planet. A new free self-sufficient life for millions. The biggest free gift ever handed to the human race. Damn it, it *should* have been all that. Yet you can see the final mess coming practically from the start."

I say, "If you study Cultural Engineering, you can. When Figueroa was discovered, nobody did. Our Department wasn't founded until twelve years after colonization had begun. Next time—"

Don makes the Laughing noise again.

"Lizzie, next time there's a find rich enough to touch off the kind of greedy, headlong rush that ruined Figueroa, the same thing will happen again. Dammit, I bet it'll happen again *here*.

"You know, the Firsters have got a right to be aggrieved. They're the one group who set out to colonize this planet by their own hard work, and they've been swamped by people who expected to have everything handed to them on a plate and the others who expected to make a profit by doing the handing. I think they do have a right to take over anything they can use. But if they make a go of it and Figueroa is ever in running order again, there'll be another rush of would-be colonists, half of them claiming that they've inherited property here or bought the rights to it from the previous occupants. The Corporation will sell their rights to some other damned group, probably the same people under another name, and they'll descend on Figueroa with a regiment of lawyers and

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a battalion of goons, and the Firsters will be worse off than they are now."

I say, "It doesn't have to be like that."

"Maybe it doesn't have to be, but it will. The Firsters won't even know what rights they have in that situation, and there won't be anybody to tell them. They'll be chased out; or they'll stay and fight and be accused of piracy, which means the Three Planets will more or less have to intervene and the Firsters will be lucky if their home settlements aren't bombed out."

No Government in the Outer Planets can afford to overlook Piracy, because the Populations they govern are quite aware that it could be their turn next.

I say, "The Firsters may not know what's likely to happen, but *we* do."

"What good is that? We're leaving."

"We can leave a Warning behind. The Firsters aren't fools. They feel they've been done down by outsiders; they won't have any difficulty believing it could happen again."

"All right, you could trigger off planet-wide Paranoia, but what good will that do?"

I say, "*Not* Paranoia, just Awareness that certain Consequences will follow certain Acts. Specifically, that if they try to take over installations on this Continent there is a big risk of losing them again; so they shouldn't invest more Effort and Materials than they can afford to abandon. Where is the Paranoia in that?"

Don sighs heavily. "Lizzie, people aren't reasonable. They don't pay attention to Warnings, either. The Russett Research Unit has been firing off dire warnings as regularly as a traffic beacon for three years, and nobody took a blind bit of notice."

I say, "And look what happened. If we leave them a few of those old Reports the Firsters can see we know what we're talking about, because the warnings have come true.

"It doesn't have to be all Warnings, either. You said the Firsters wouldn't know what rights they have. We can tell them. There are quite definite Rules about property abandoned on planets still in course of colonization; the Hulk computer's bound to have it all. We can leave the Firsters printouts, with a summary to explain what it's got to do with them."

Don says, "How much use is a printout of the Law when you're dealing with a goon squad?"

I say, "It can help to deter people from sending goon squads. But mostly it can warn people which things lead to trouble, and how to avoid them—"

Somebody says, "Stars and Nebulae, has Lizzie found some new Cause to hold forth about?"

The Astral Cad, of course. He and Blazer have just returned with four smallish compact heavy-looking packs.

"We've checked everything," says Blazer. "Shall we stick the extra copies in the destructor?"

Don says thoughtfully, "No . . . We might have use for them."

"Don't tell me," says the Cad. "We're going to make little paper kites with them and fly messages to *Msilikatse*, to let them know—"

"No," says Don in a tone of abrupt Decision, "we're going to run an exercise in Cultural Engineering."

* * *

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At first the Point is only to fill in the time until *Pedagogue* arrives, but before long it has turned into a real Project. The stack of printouts gets thick and the time approaches midnight. There are empty cups on every ledge, Dad's housekeeper Buffalor Cole would be Shocked and horrified but I am not going to drop out of the Argument to tidy them away.

By now we have got on to Government; it is generally agreed that the Firsters are going to need one, for Outside Relations only. The Cad and I are Arguing about What title or description is least likely to convince the Firsters that they are handing somebody a Mandate to interfere with Internal Affairs when there is a sudden buzz from the Control Room alarm, followed by a shout from Blazer Weigh.

"It's *Pedagogue!* She's come!"

Pedagogue is transmitting Print not Voice; by the time we get to the control room Blazer has acknowledged the first call, and the second installment is just coming through on the screen;

PEDAGOGUE TO GROUND PARTY. WILL PICK YOU UP IN TWO HOURS SAME PLACE. ACKNOWLEDGE.

Comment is immediately Drowned by a blare from the speakers.

"You in the old ship! Tell your friends with the funny name you're not leaving until we check you haven't set any booby traps. Open the main hatch, or we'll open it for you."

By way of Illustration there comes a Thump! that shakes the whole Hulk.

I had not exactly Forgotten that we were Besieged, but I certainly had not been thinking about it. We had been discussing the Firsters for twelve hours as though we were all on the same Side, and the Reminder that this is Not how they see things comes as a distinct Shock.

"They've rigged a battering ram," says Don grimly. "*Now* what do we do?"

Pedagogue's Com officer is feeling Neglected and a message appears on the screen saying Do we copy, Acknowledge please.

Blazer glances at Don for Instructions, gets none, shrugs, and taps out GROUND PARTY TO PEDAGOGUE. SNAGS HERE DEFER DESCENT.

Thump!

The Cad says irritably, "Haven't we anything to Discourage that?"

"They'll discourage themselves in time," says Don briefly.

"Hull's armorplate, not standard," Blazer explains.

Pedagogue comes through with a request for details on the Snags and sets off an argument: the Cad wants to send SURROUNDED BY HOSTILES, SEND HEAVY SQUAD, in the hope this will Frighten the Firsters off.

Don says there is No sense in such an obvious bluff and dictates a brief statement of the Facts; Blazer wants to put it in Code, but Don says the Firsters know the Facts already and Code will simply increase Mistrust of which we have already More than enough.

I say, "Look. In fact we have *not* booby trapped anything so why not let them come in and See?"

This sets off another Argument, in the middle of which the next message from *Pedagogue* arrives. I wonder why

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they have not used Code, despite the Mistrust factor, because it runs:

PEDAGOGUE TO GROUND. INFRARED SHOWS ABOUT FIFTY UNITS IN YOUR VICINITY. CAN BESIEGERS BE TRUSTED NOT TO HIJACK LANDER, IF SO ADVISE PERMIT SEARCH.

I suppose John Li Chu in *Pedagogue* knows that he has really set us an Insoluble question because the next message comes a few minutes later:

PEDAGOGUE TO GROUND. IF NO GUARANTEE LANDER SAFE MUST SEEK MILITARY ASSISTANCE.

Now I see why they are sending in Clear; it is intended as a Deterrent to the Firsters. I just hope it does not work the wrong way.

Blazer Weigh is thinking of another Consequence and makes it known in a Shout of horror: "Military Assistance? That means we'd be Stuck here for another week!"

This leads to Uproar and a series of plans for driving off the Firsters long enough for us to reach the Landing ground. I am trying to decide whether in fact we could Trust the Firsters, supposing they promised to let us go to the Lander without trying to Capture it; I think we probably could, but Probably is not apt to be good enough for John Li Chu. . . .

I become gradually aware that the Floor has started to Vibrate; and just as this Registers clearly the Vibration rises up the scale and turns into Sound. It is the most Enormous, Earth-shaking, Ear-boggling Rumpus that ever invaded my Consciousness, and while it is going on I cannot Think or do anything else; then after about thirty eternal seconds it suddenly Stops.

There is one second of echoing silence, and then a voice from the radio; "*Landing Alert.* Msilikatse *landing alongside row of houses at Coordinates* (a string of numbers which Blazer feverishly starts to check). *Clear the area. Warning. Clear the area Coordinates* (Numbers again) Msilikatse *landing in ten minutes. Clear below.*"

Not even Blazer notices for some moments that *Pedagogue*'s Com officer has come through again.

PEDAGOGUE TO GROUND. VERY LARGE OBJECT IN YOUR VICINITY, TWO KILOMETERS UP AND DESCENDING. HOT SPOTS DISPERSING. SUGGEST YOU EVACUATE.

The question is, Do we trust *Msilikatse*'s Navigator or not. . . . In the end it more or less goes by Default, before we have Settled anything there is that appalling Noise again for a few seconds, then a great Wallowing tremor in the ground underneath; then the radio again.

Msilikatse *landed safely.*

Then a minute later: "Msilikatse *to Terran Friends. The wicked ones have run. Tell your Lander to come quickly before they return.*"

When the Lander eventually comes down it is on *Msilikatse*'s two acres of upper deck, which is a much bigger open space than the one where they landed Blazer Weigh and the Astral Cad. However, that is not for several hours. Meanwhile there has been an Emotional meeting in *Msilikatse*, which turns into a Celebration when the Chief Engineer has grasped that the Hulk has

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a Proton Monopile capable of recharging his Accumulators in four hours flat.

The Dagombans learned of our Situation by way of the radio traffic with *Pedagogue*, in which the Monopile was not mentioned; the Firster's messages were too roiled by Interference to be understood.

Another Item has been added to my list of Things I Never Thought Of, namely Space Ships Fly. But it did not occur even to Blazer that a ship the size of *Msilikatse* could take off to fly fourteen kilometers and then land again. (Of course on any properly Settled planet a ship putting down anywhere except on the designated Space Field would be landing in very hot water indeed.)

And it certainly would not have occurred to any of us that *Msilikatse* might Take off and Land just to make our Besiegers run away, simply because we had once tried to help *them* and therefore they considered us friends.

It is not till we return to the Hulk to show the Chief Engineer and his staff the kind of connections he will need to make to the Monopile that we discover a string of plaintive Messages from *Pedagogue*, wanting to know What goes on; and John Li Chu is not Happy when informed that we shall not be ready to take off for several hours. However we point out he would lose a lot More time if he had to go to Rosemary in search of Military Assistance and that we are finishing a Professional Job.

Of course there is no way to know that the Firsters will use our Recommendations and Reports for anything but Kindling; but we have also put out the Manuals on all the more important pieces of equipment, with Notes by Blazer on the various Peculiarities they have developed over the years; which ought to show that we really do mean well by them, at least. Also a Document stating that the equipment in the Hulk is now the Lawful property of the people living on Figueroa at the date of our departure, which might be Useful if anyone tries to take it away.

We have to Leave before the Dagombans have finished Recharging, and then they have to go back to the Space Gate to take on board plants they will need for Reoxygenation, also some equipment that got left outside when they Took off to the rescue; but after the Lander docks in *Pedagogue*'s garage space and just before we break orbit the Radar shows a massive Shape floating slowly up from the ground. The Com officer comes in with a Message, badly garbled, but with enough Redundancy to be sure that it is saying Goodbye, they are going Home.

So are we. Back to Russett, that is.

If M'Clare says I have not done my Assignment and must Repeat Field Studies I shall go on Strike and also Strike him, Field Studies are mainly for Experience and I consider I have Had Enough.

Anyway I have certainly Learned a lot; some of it I will not know I have Learned until later on, but one important thing I am sure of Now.

With Mankind Expanding in all directions and new planets being colonized every decade, people *need* Cultural Engineers. ■

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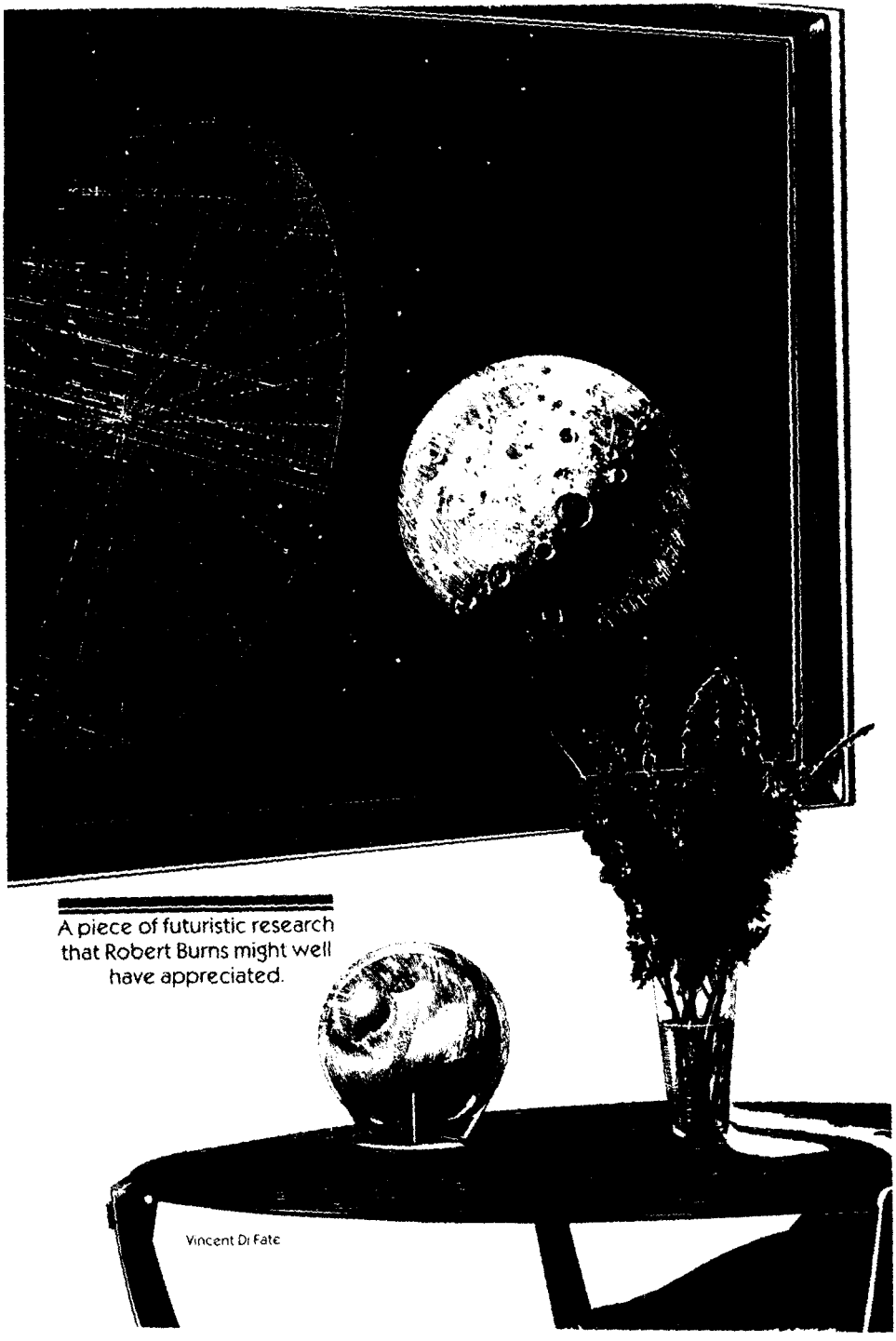

A piece of futuristic research that Robert Burns might well have appreciated.

Vincent Di Fate

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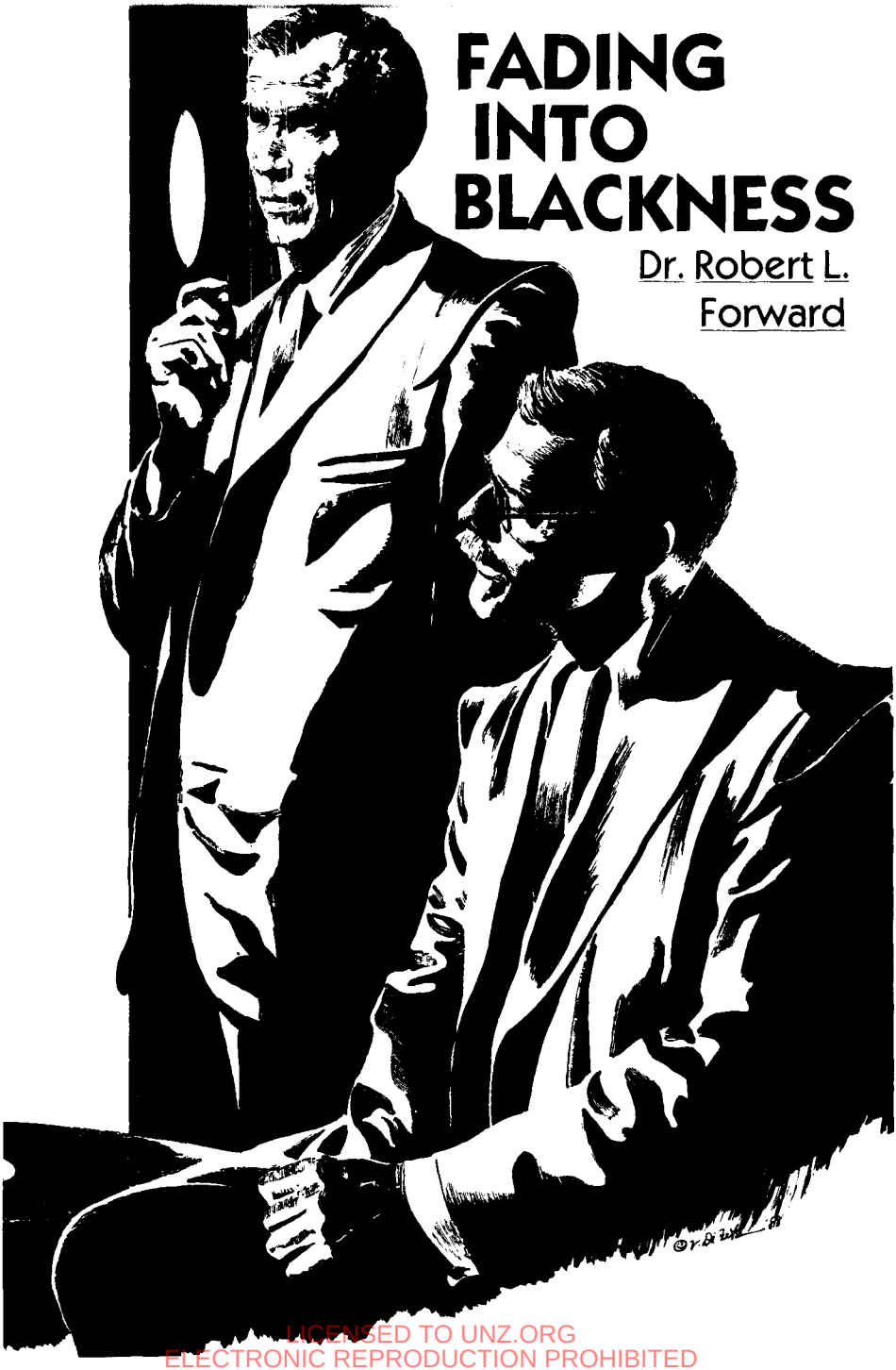
FADING INTO BLACKNESS

Dr. Robert L. Forward



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"You are absolutely crazy!" James exploded. He hunched forward to sit perched on the edge of the plush sofa, his voice echoing in the cavernous office of his boss.

Michael Lord, media magnate, was leaning far back in his chair behind his desk, grinning like a student who has just thought of a great prank to pull. In back of him was a huge flatscreen showing a sunlit view of the whole Earth. The living image came directly from one of the dozen geostationary direct broadcast television stations that Michael Lord owned. Despite his annoyance, James's gaze was drawn once again to that brown and blue globe covered with clouds of wispy white. A fragile globe that was home to billions of humans.

This particular picture came from Station North America One that hovered over Canada, one of Michael Lord's first customers. It was near noon in Canada, so that particular full sunlight view of the Earth was being broadcast during every station break over every station around the globe. For the station breaks, the living image of the Earth was surrounded by the words, "LORD WORLD BROADCAST NETWORK LIMITED," to produce the always varying, never-the-same logo of the Michael Lord empire.

Michael Lord had made his billions by finding a way around the International Telecommunication Treaty that controlled access to the geostationary orbit. He had realized that if he built broadcast stations that used a large solar sail to get constant thrust from sunlight, then the stations could be placed in artificial orbits that were many hundreds of kilometers above or below the equatorial geostationary orbit, yet still only rotated around the Earth once a day. Since they were not in a natural orbit controlled solely by the Earth's gravity, his lawyers had successfully argued that his "stations" were not "satellites," and therefore were not regulated by the treaty.

James lowered his glance from the screen to find Michael Lord still grinning at him. "I *won't* let you do it! You can fire me if you want—I'm sure I can find lots of jobs at a million per year—but I won't let you throw away a hundred billion on this crazy scheme . . . this 'wisp' of glittering nothing."

"You just earned yourself a lifetime pension at a million per, Jamey," said Michael Lord, who had heard all this many times before from his old college roommate and fanatically faithful right-hand man. "But I hope you'll stay on at two million per in addition to make sure it's done right."

"*Sure* I can make sure—with your money I can make sure of anything. But to spend your entire net worth on this will-o'-the-wisp doesn't make sense to me. It won't get to Alpha Centauri for twenty years, long after we both are doddering old wrecks, if not dead. Then all it will do is send back pictures, which won't arrive back here for another four years or so. I also don't see why you are going to interrogate it on the trip out. All you'll get will be pictures of nothing."

"Exactly."

James did his job—as no one else could—nearly perfectly. One billion of

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Michael Lord's money went into design studies.

First was the design for the large solar power satellite, ten times bigger than any that had ever been designed before. It would generate the 50,000 megawatts of microwave power that would be needed to accelerate the interstellar probe up to twenty percent of the speed of light.

Second was the design for the radar dish that was to focus the microwaves into a far-reaching beam. It was ultra-large, four times larger than the diameter of the Earth, and ultralight, made out of a thin disk of fine wire mesh. The wire mesh disk was to be shaped into a nearly perfect parabola by centrifugal acceleration from a slow rotation of the disk combined with a linear acceleration from a million electric ion thrusters spaced around the periphery of the disk.

Finally, there was the interstellar probe itself, a wisp of ultrafine wire woven into a hexagonal mesh that was a kilometer in diameter, yet had a total mass of only 16 grams. At each six-wire intersection of the mesh was a microcircuit, so tiny that all 100 billion of the microcircuits had a total mass of only four grams. It's name was to be —"Starwisp."

"Fascinating," said Michael Lord, staring at the thin shred of black veil floating in the center of the large glass globe that James had placed on his desk. "It's so light it just floats there."

"Actually, it's levitated," said James. "There's a small battery-powered microwave generator built into the base of the globe. It makes a beam of microwaves directed upward. The microwaves bounce off the wire mesh with enough force to lift it against gravity."

"Open the globe and let me feel the mesh," said Michael Lord.

"I'm afraid I can't do that," said James. "In the first place, the wires are so fine that the mesh would tear at the slightest touch. Second, the globe is evacuated. The minute any air got to the mesh, it would be eaten away and all you'd have left would be a drifting cloud of microcircuit dust."

"Fascinating," said Michael Lord again. He had found the power control to the microwave generator in the base, and was pushing the miniature model of the Starwisp probe up to the top of the globe, then letting it fall. He stopped for a second and looked up at James.

"Let's proceeed with the next phase."

"If you insist," said James reluctantly, and started the long walk across the office. At the door he stopped and turned to look back at his boss. Michael Lord's gaze was again on the globe, watching the nearly invisible wisp as it rose and fell inside.

While James waited politely for Michael Lord to look in his direction, his attention was drawn once again to the constantly changing view of the living Earth on the flatscreen. This view was from Station South Pacific Two. On one side of the Earth he could see Hawaii, where they were. On the other side he could see the huge monsoon that was savaging the lower part of India. The news being broadcast that very minute over Michael Lord's worldwide news network was showing terrible scenes of havoc and human suffering. Like many others who had seen pictures of Earth from space, James was struck yet again

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by the thought of all mankind being just space travelers, wandering through the galaxy in a fragile blue globular spacecraft.

"Yet still we squabble," he thought.

James shook his head and lowered his glance from the image of the Earth and continued waiting. Michael Lord finally stopped playing with the microwave controls and looked up.

"I *still* think you are absolutely crazy!" James said vehemently, and slammed out the door.

It took five years and a good deal of Mr. Lord's money to start construction of the solar power satellite. But, even as James had to admit, it was a good investment. New scientific advances in methods for the direct conversion of sunlight to microwaves gave the solar power satellite an energy conversion efficiency of 75%. That was many times the efficiency of solar cells and twice that of ground-based power plants. The advent of room temperature superconducting power transmission lines had allowed the microwave receiving stations on the ground to be placed in uninhabitable deserts, oceans, and frozen wastelands far from the cities that needed the power. The customer list for the first 5,000 megawatt section was oversubscribed even before it was completed, but Michael Lord insisted on reserving the first month of output for preliminary tests on a tenth-scale prototype Starwisp.

James sat back in the sofa, holding the remote control for the flatscreen on the wall. Michael Lord came from behind his desk and joined him. The living Earth on the screen now came from Station South Africa One. James pushed the button on the remote control and the picture of the Earth was replaced by a picture of Powersat Alpha, the flagship of Lord Powersat Limited.

"Nothing much to show you here," said James. "I'm sure you have been monitoring construction progress yourself."

"I notice the microwave transmitter array in the center is no longer pointing at Earth," said Michael Lord.

"The engineers wanted to get maximum efficiency for this test," said James. "So they rotated the antenna array so that it points to the microwave dish in its high orbit over the South Pole. Once Powersat Alpha is up to full power the transmitting array will stay pointed at Earth. Using standard phased array techniques, it can feed power beams to a dozen Earth stations at the same time as it is sending a beam out to the interstellar probe." He pushed the button on the control again. All that could be seen on the screen were a few stars and a thin ellipse of pinkish-blue lights.

"This is the microwave dish that will turn the broad microwave beam from Powersat Alpha into a narrow beam. This tenth-scale model can form a beam that will reach halfway to Mars. The full scale model will reach from here to Jupiter. You can't see the mesh, but you can see the exhaust from the ring of xenon ion engines around the rim."

James referred to a sheet of paper, then pushed the button for another channel. The long vertical ellipse of glowing electric rocket engines was replaced by a smaller horizontal oval of rocket lights.

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"This is the flat mesh mirror that collects the microwave beam from Powersat Alpha and directs it down the axis of the beaming dish. The beaming dish stays pointed in the direction the probe is supposed to go, while the flat mirror wobbles slightly once a day to track Powersat Alpha below as it rotates around the Earth."

"It's a shame that the mesh structures are too fine to see," said Michael Lord. "Fortunately the electric rockets give us their outline. I presume you are not going to even bother trying to show me the tenth-scale Starwisp."

"Since I knew you would be interested, I had the engineers take out some video equipment and give it a try. They were actually pretty successful. By aligning things so the camera is on one side of the sail and the sun on the other, they were able to get enough forward scattered light to see the mesh. It's the same technique that they used during the Voyager flybys to take a picture of the rings around Jupiter." James gave the button another push and a bright oval of light appeared on the screen.

"There's 'Lord's Folly,' " said James. "All 200 milligrams of it. It's sitting out about half way between the Earth and Moon, lined up between the beaming dish and Mars."

Michael Lord winced. "I thought 'Starwisp Prototype 0.1' was its name."

"That's its official name," said James. "But it's much too long for daily use. Since you didn't make up a name, I did. . . ." He paused, "I *still* think you are absolutely crazy!"

Michael Lord smiled determinedly. "Let's see what . . . 'Lord's Folly' . . . can do!" he said.

James took out a beeper-type communicator and held it up. "The microwave beam will be triggered at Powersat Alpha as soon as this signal gets transmitted through the earthcomm links," said James, "but it will take about a second for the beam to make it out to the beaming dish above the south pole, then almost another second before the microwaves reach the prototype microwave sail." He pushed the button and they both watched the illuminated oval on the screen as James counted.

"One-thousand one. One-thousand. . . . There it goes! My God, Mike, it's really working!!"

The glowing oval of mesh billowed slightly, then started moving off, slowly at first, then faster and faster as the constant 10 gravity acceleration built up its velocity. The camera swiveled to follow it. The oval shrank . . . changed into a circle . . . then faded away into blackness.

"Let's see the pictures it's sending back," said Michael Lord.

James looked down at the remote control and selected another channel. A high resolution picture of the Moon showed up on the left hand side of the screen. It was moving noticeably toward the edge of the screen as the prototype Starwisp accelerated in a direction to one side of it.

"At this distance from the transmitter there is more than enough microwave power impinging on the sail to power the microcircuits," said James. "The real test will be when the distance between them is light-years, not Earth radii."

"Any engineer can calculate that," said Michael Lord, "and even *you* will

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have to admit that with the full-sized dish directing the microwave beam, that there will be plenty of microwave power flooding the Alpha Centauri star system to power the mesh circuits. What I was really worried about was the ability of all those billions of microcircuits to work together as an image processing computer. *Look* at that picture!''

''I've got to admit it is high quality,'' said James. ''Better than the video cameras on your broadcast stations. In full color too.''

''With a billion microcircuits, each with a photosensitive detector looking in a different direction and sensitive to a different color, you have everything you need to make a picture. It's just a matter of each microcircuit working with its neighbors to unscramble the billions of bits of data to make an image.''

''We'll find out how well it performs tomorrow, when the sail approaches Mars,'' said James. ''The engineers will lower the microwave power in the beam until it is as weak as it would be if it had to travel from the solar system to Alpha Centauri. The probe will only have one watt of power reaching it. And with that one watt the probe has to power a billion microcircuits with a billion photodetectors, and carry out a billion calculations for each picture.''

''I'm looking forward to seeing Mars up close,'' said Michael Lord. ''What time does . . . 'Lord's Folly' get to Mars?''

James chewed his lower lip as he consulted a schedule. For once Mike might be right and he was wrong. ''Lord's F—Starwisp Prototype 0.1 arrives within imaging distance of Mars tomorrow morning at 0920,'' he said. ''It will be traveling at almost two percent of the speed of light. At that speed, it'll shoot past the orbit of Mars in just a few minutes.''

''I certainly don't want to miss it,'' said Michael Lord. ''I'll see you promptly at nine-fifteen and we can watch it together.''

''I'll be here,'' said James. ''And I'll bring a written apology along with my letter of resignation.'' He put the remote control for the flat screen on the table in front of the sofa and left the office.

''And I'll file them the same place I filed all your other letters of resignation, Jamey,'' said Michael Lord to the closed door. He walked over to the table in front of the sofa and picked up the remote control. He pushed the button for one of the higher numbered, seldom used, channels that were for calibration of the probe's imaging system. This channel used the photons coming from the backside of the probe that had managed to penetrate through the back of the thin microcircuits to reach the photodetectors from behind. It formed an image of objects in the direction that the probe had come from. It wasn't as good as the image from the front side, but it was still better than a standard high resolution video camera.

As Michael Lord switched on the channel, a picture of the Earth as seen from the probe appeared on the screen. The Earth was three-quarters full and flanked by the Moon, also three-quarters full. He watched for a few minutes as they shrank slowly on the screen. He smiled with satisfaction, then switched the flatscreen back to its normal full Earth living picture from one of his

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broadcast stations. If it was nearly midday under Station South Africa One, it must be time for him to go to bed. He yawned and went through the door behind his office to his apartment.

The images of Mars were fantastic, even after the engineers had lowered the microwave power shining on the minuscule spacecraft to less than a tenth of a watt. There was now no question the technology worked. A large enough microwave dish could send a beam that could push a lightweight spacecraft to speeds approaching the speed of light. The same microwave dish could supply power to that same spacecraft over interstellar distances. And that same microwave dish could also receive return signals from the spacecraft many years later that contained real-time, high-resolution, color television pictures of the planets in that new star system as the high-speed sail sped through it. Now all that it was necessary to do was to spend the money to build it.

Fortunately, James was up to the task. Nearly 80 billion more went into the completion of the 50,000 megawatt solar power satellite, but it started generating a net cash flow before it was completed. Another 15 billion went into the full scale beaming dish, four times bigger than the Earth, in a far orbit that took it high over the South Pole, guided by its electric ion rockets as the engineers tuned the millions of components so they would work as a whole. Then, finally, a kilometer wide sheet of thick plastic was unrolled far out in space in the southern skies of Earth. Printed on the plastic was Starwisp. First were the multitude of ultrathin wires that formed the body of Starwisp. At each intersection of six wires were the multitude of multilayered microcircuits that formed the brain of Starwisp. In each microcircuit were the multitude of photodetectors that formed the retina of Starwisp.

After baking for two days in the intense ultraviolet glare of the light from the sun, the plastic backing decomposed. Starwisp now floated in space, naively looking at the light sources around it, and waiting for the first of the microwaves from Earth that would fling it outward to the stars.

"It's taken five years and 122 billion," said James. "Instead of holding a majority interest in your properties, you are a minor stockholder. I hope you're satisfied."

"Of course I'm satisfied, Jamey" said Michael Lord. "I've always been satisfied with everything you have ever done for me. Haven't you arranged it so that I am still CEO of Lord Broadcasting Network Limited, even if I don't own it?"

James frowned in annoyance and begrudging acknowledgement.

"Besides," continued Michael Lord. "What is the use of making money if you don't spend it? I certainly can't take it with me."

"The one who dies with the most toys wins?" said James. "I never thought you were that type, Mike. But you certainly have bought the most expensive toy ever made."

"Some toys are purely for fun," said Michael Lord, "Others are designed to educate. . . ." He drew a deep breath.

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"It's time to launch Starwisp on its way. Push the button."

"That's your job," said James brusquely, handing him the special beeper with a single button.

Michael Lord shrugged and pushed the button.

Ten full minutes dragged on as the microwave beam shot out from Powersat Alpha around the Earth, flashed southward to the deflector mirror, bounced off the beaming dish, and shot across interplanetary space to Starwisp, waiting patiently in the southern skies. Starwisp billowed slightly as the leading portion of the microwave beam struck it, then straightened out and started accelerating toward Alpha Centauri. Five minutes later, the billowing was seen on the flatscreen in Michael Lord's office on Earth as well as billions of video screens around the globe.

Starwisp accelerated at more than one hundred times Earth gravity, and was beyond the range of the monitor cameras within a few minutes. The news broadcasters, having nothing on their screens, switched to interviews of people around the world.

"Mr. Lord is daft, spending all his money like that. I certainly would have saved a little fer me kids and me old age."

"With millions of hungry people starving in Bangladesh and Ethiopia, it is criminal to throw away money on an egotistical whim!"

"Eh bein . . . I do not see the good of this."

"Dinkum nonsense!"

At the closing of the broadcast, Michael Lord had the living Earth logo for his network changed to an image of the Earth taken from the rapidly receding Starwisp. Even at the maximum magnification the mesh imaging system was able to supply, the Earth was noticeably smaller than the image the audience had been used to.

Starwisp continued to accelerate for ten hours under the powerful push of the microwave beam. By the time it had reached the limit of the beam, it had passed the orbit of Jupiter and was on its way out of the solar system at twenty percent of the speed of light. Some twenty-four years later, the human race would see pictures of new planets from its front side imaging system. Now, its back side imaging system was sending pictures of a familiar planet—Earth.

As the hours passed, the image of the Earth shrank on the screen. The hourly reminders of the shrinking blue-white globe during the day brought home to the human race the smallness of its triumphs, the pettiness of its squabbles, the frailness of its home. Soon many found themselves staring closely at their television screens, searching through the fluctuating pixels for the tiny dots that were the Earth-Moon system.

After just two days, Starwisp had passed out of the solar system, leaving Neptune and Pluto behind on its twenty year journey to the nearest stars. Even when the Sun started to appear at one side of the magnified image—the Sun itself was nothing but another star in the sky, lost among the multitudes of other stars.

Day by day, the world watched as the Earth faded away into blackness. . . .

And grew up. ■

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John Gribbin

SEEKING THE MISSING MASS

This isn't exactly "garage research," but by present standards— and compared to the importance of its subject— it looks like a real bargain!

COSMOLOGISTS seeking the "missing" nine-tenths of the universe may be about to have it located for them—in the laboratory. The cost of the experiment which may at a stroke reduce all of astronomy—all of science!—to date to the equivalent of studying the tip of an iceberg is modest almost to a fault, less than $3 million. And results could start coming in by the early 1990s.

Aficionados of John Cramer's Alternate Views will already be aware that at least 90 percent, perhaps as much as 99 percent, of the universe is in the form of dark matter that has never been seen, and which is only detected today by its gravitational influence on galaxies and clusters of galaxies in the universe at

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large. Individual galaxies, such as our own Milky Way, rotate at speeds which would cause them to break up, and fly apart like an overstressed flywheel, if there were not plenty of dark matter holding them together gravitationally. And whole clusters of galaxies, some containing hundreds of systems like the Milky Way, are also in dynamic activity, with individual galaxies moving so fast that they would boil off from the cluster if there were not far more matter than we can see binding the galaxies to one another.

Astronomers talk of the "missing" matter, but in truth there is ample evidence that the matter is there. What is missing is the light by which we might expect to see it. Most of our universe is in the form of *dark* matter, a much more apt name (see Cramer's AV column, February 1985). Over the past couple of years, there has been little progress on the theoretical front regarding ideas for what the dark matter might be. Theorists are sure of one thing, that it cannot be the kind of matter we know and love, made up of the same kind of particles as the atoms of our bodies, or the material of the Earth, Sun and stars. That kind of matter, called baryonic, is chiefly composed of protons and neutrons. The highly successful Big Bang model of how the universe began sets very strict limits on the amount of baryonic matter—the numbers of protons and neutrons—that there can be in the observable universe, and the matter in all the bright stars and galaxies just about accounts for that limit.

What else could the dark matter be? The best bet is that it is in the form of a sea of sub-atomic particles spread fairly uniformly through space. But what particles? The only non-baryonic particles that we know exist and fill the universe are the neutrinos. Unfortunately, there is no evidence that neutrinos have the mass required to do the job—the best evidence, including recent analysis of neutrinos from the supernova in the Magellanic Cloud, leans towards their having zero mass, like photons, or at any rate a mass too small to fit the cosmological requirements. Theorists like the idea of particles called axions, which nobody has ever detected but which ought to exist if favored theories of particle interactions are correct. But the first results from a new experiment running at the Brookhaven Laboratory on Long Island suggests that axions cannot account for the missing mass either.

The technique, reported in *Physical Review Letters* (vol. 59 p. 839) by a team of researchers from the University of Rochester and the Brookhaven National Laboratory, both in New York, depends on the prediction that an axion in an intense magnetic field will be converted into two photons. Axions themselves are hard to detect, but the photons could easily be spotted, as a burst of microwave radiation.

Theorists calculate that if all the dark matter in the universe is in the form of axions, then each axion has a mass of about 10^{-5} eV (the electron has a mass of 500 keV) and that the density of axions near the Earth should be 5×10^{-25} grams/cubic centimetre. That is, there may be some 20 trillion axions in every

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thimbleful of space.

The new experiments have been carried out under the leadership of Adrian Melissinos, using a 6 Tesla superconducting solenoid, with a bore of 20 cm, cooled by liquid helium to a temperature of 4° K (it looks rather like a stack of three paint cans, one on top of the other). No photon pairs that could be attributed to axion conversions were observed in the tests. This result is preliminary, but one interpretation is that the mass of the axion is 10,000 times less than the amount required by the cosmologists—if axions exist at all.

Of course, these are early days. The experiment only began running in 1987, and it will take at least two years for the Brookhaven team to be persuaded that there are no detectable axions at all. But the longer the experiment runs without finding anything, the more seriously physicists will have to consider other candidates for the missing mass.

These exist in profusion. Any competent theorist can dream up a particle which has mass but has never been observed. The clever trick is to dream up a particle which has properties that match some set of observations—which is why the detection of an axion or two at Brookhaven, would help to concentrate the theorists' minds wonderfully. Among the current flights of unproven fancy is the possibility that every single type of particle known is "mirrored" by an as yet undetected "supersymmetric partner." That is, the electron has a partner called the selectron, the neutrino is mirrored by the neutrino, and so on. Another exotic idea is that as the Universe expanded out of the super dense fireball of the big bang, little bits of space time might have been trapped in a super dense state, stretching out to become infinitely long, infinitely thin but very massive "cosmic strings," stretching across the universe and breaking off loops which could act as the gravitational seeds on which galaxies might grow (just to confuse the picture, "cosmic string" is not the same as the also fashionable modern idea that particles such as protons are made up of entities called strings; maybe John Cramer can explain that, some time).

This is all good fun for the theorists, although largely untestable and therefore unprovable. But the best candidate for the dark matter, unless axions show up soon, has been invoked by theorists on much more solid grounds, and might be very susceptible to detection, now that experimenters have the motivation.

This kind of dark matter particle was originally invoked by theorists not to explain the mysteries of the cosmos at large, but simply to resolve a puzzle about our own backyard—why the temperature at the heart of the Sun is about 10 percent less than theory says it ought to be. Prosaically named WIMPs, for Weakly Interacting Massive Particles, they would each have about five or six times the mass of a proton, and their presence at the heart of the Sun would help to smooth out its energy production, making it a little cooler at the very centre (AV, May, 1986). But where would the solar WIMPs come from? Presumably, they are gathered up by the sun as it moves through space, and

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therefore the universe must be filled with a sea of WIMPs. Such a large mass for each WIMP means that these particles, if they exist, could easily fit the required role of the cosmological dark matter, even though the astronomer who first "invented" them, John Faulkner of the Lick Observatory, had no such ambitious hopes in mind when he dreamed up the idea. It would also make them almost laughably easy to detect —provided you set about it the right way.

The intriguing point is, nobody thought of looking for such particles until Faulkner, and other astronomers, decided they might be needed to explain the sun's behavior and to provide the missing mass. Particle physicists have been used to the idea of building ever bigger and more expensive accelerators, with which to reach ever higher energies and probe, as they imagined, ever more fundamental properties of the physical world. It simply never occurred to particle physicists in the 1980s that the universe might be swarming with particles, each one more massive than a helium atom, that have never been detected, because of the weakness of their interaction with everyday matter (hence the name), but which *could* be detected, with a little cunning.

Needless to say, there is now something of a race on to be the first lab with a WIMP detector up and running. Blas Cabrera, of Stanford University, is ahead of the pack in the U.S. You may remember Cabrera; he has the experience of building traps for exotic particles, and hit the headlines a few years back when it seemed he had caught a magnetic monopole in one of them. The evidence is as good as it ever was, but the detector never found another monopole, and until more show up the "discovery" is being treated as a spurious event. WIMPs get their name, as I mentioned, because they only interact weakly with the kind of baryonic matter we are used to. They simply don't "feel" forces such as electromagnetism, which are so important to atoms. But that doesn't mean that WIMPs are not solid and real, and if a particle with a mass of six protons wallops into an ordinary atom then it knows it has been hit (which is how WIMPs smooth out the temperature at the heart of the sun).

The detectors now being planned and built depend on this. In essence, they set out arrays of crystals, such as pure silicon, and wait for a WIMP to hit one of the atoms in a crystal. You can get some idea of what the impact of a fast moving, massive particle does to the ordered structure of atoms in a cold crystal by looking at what happens to the ordered triangular pattern of the balls on the pool table when you break off. Of course, head on collisions between WIMPs and atoms will be rare; most WIMPs will pass through the crystal lattice and between the atoms, without interacting. But when one does strike an atom full on, the knock on effect of the bump will set other atoms in the crystal vibrating, producing an ordered vibration, or phonon, which emerges at the other end of the crystal and can be detected by suitably sensitive (which means superconducting) instrumenta-

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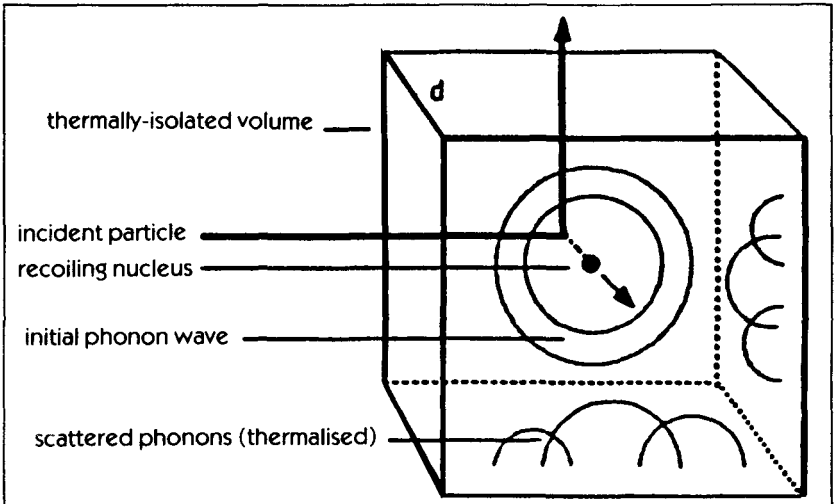

Figure 1: Conversion of nuclear recoil energy to phonon wave, and subsequently to a rise in temperature after scattering and thermalisation of phonon distribution.

tion (Figure 1).

The technique is so crude, in principle, that it seems like a relic from a bygone age. It is like the way Ernest Rutherford and his colleagues first probed the structure of the atom, back in the early part of this century, by shooting beams of particles at gold foil and watching to see how the beams were deflected when they hit atoms. Experimental physics has no right to be so straightforward in the late 1980s! But the superficial simplicity of the approach conceals a need for subtle techniques to make sure that *only* collisions with WIMPs are recorded. Unless the crystals are cooled close to the absolute zero of temperature, for example, the ordinary thermal vibrations of the atoms will make so much noise that WIMP impacts simply won't be noticed. And unless the whole apparatus is well shielded, impacts from such familiar particles as cosmic rays will produce all kinds of "signals" that are not wanted. Which is why astronomers in Britain, Cabrera's chief rivals in the race to find the WIMP, may soon be building a new telescope at the bottom of a salt mine in Cheshire, in order to probe the heart of the sun and the depths of the cosmos. It sounds like something out of Alice in Wonderland, but it's actually one of the most exciting projects in science today.

Talk of "phonons" and their detection sounds suitably impressive in the jargon of particle physics. But we can also think of what is going on in more everyday terms. If a particle of dark matter slammed into a crystal of a material such as silicon, its energy would

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shake up the atoms in the crystal and warm it by a few thousandths of a degree. That could be measured—provided the crystal was very cold to start with. And you also have to be sure that the unwanted influence of other particles, cosmic rays, is kept at bay. Cosmic rays are stopped by rock, but the dark matter particles ought to penetrate far into the Earth. So, you need a supercooled detector, buried down a mine shaft —entirely logical, and nothing to do with Alice at all.

Perhaps the most surprising thing about the planned UK experiment is that it can all be done with proven, almost off-the-shelf, technology. Refrigerator systems that operate down to a few *thousandths* of a degree Kelvin (a few mK) and provide a working volume of 100 litres are routinely available, while bigger ones can be built for special needs. And the sensitivity of the detectors used to measure the change in temperature of the supercooled crystals is also not in doubt. In 1984, one team of researchers detected the change in temperature caused by the impact of a single X-ray (a photon with an energy of 6 keV) on a silicon crystal cooled to 0.35 K (Figure 2). The change in temperature was about one-thousandth of the temperature of the crystal itself, a mere 0.0003 K.

The emphasis on proven technology and the modest cost of the proposed project actually tells you as much about the state of British science today as it does about physics. Repeated cutbacks

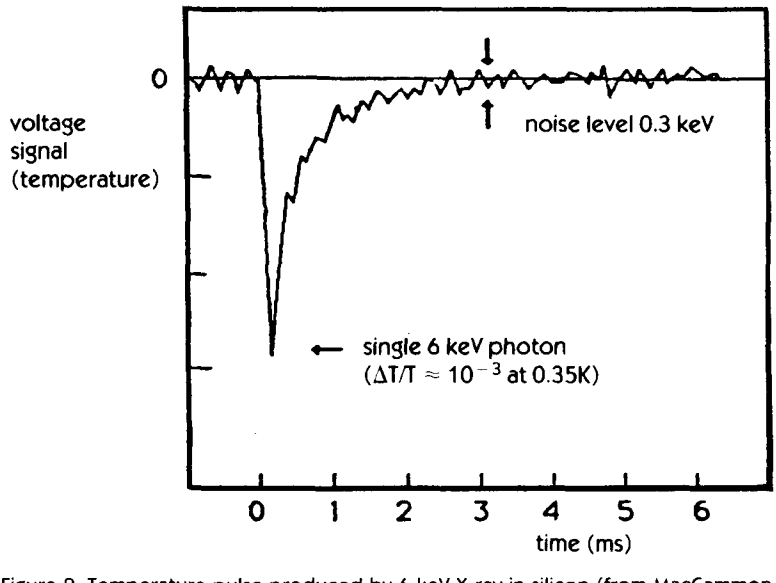

Figure 2: Temperature pulse produced by 6 keV X-ray in silicon (from MacCammon et al [39]).

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by the Thatcher government since 1979 have left British scientists demoralized and starved of funds for any new projects at all. Even so, eleven different groups of scientists around the UK are working on a design for the experiment, and it could be running in three years, they say, if it gets funds. The cost is estimated as a little over $1 million to start with, and $80,000 per year to keep it running. It does seem a small price to pay in order to be able to observe 90 percent of everything in the universe, and makes a striking contrast with the $5 billion the U.S. is likely to invest in the initial phase of the Superconducting Supercollider (SSC).

Like anyone with an interest in science, I hope the SSC gets its funds, and that it discovers many new and fundamental things about the universe. But I still hanker after the days when private individuals working in their own labs could make great new discoveries (even if only in the pages of *Astounding*), and it is an interesting thought that the cost of the WIMP detector is less than some football teams in Britain are willing to pay, even today, for a good player. I can't help but feel that it would be good for science if somebody—Cabrera at Stanford, Smith in Oxford, or anybody—were to make a discovery as important as identifying the missing mass, using an experiment whose principles we can all understand, at a cost which is still intelligible in everyday terms. And I bet the spirits of pioneers such as Rutherford would approve, too! ■

John Gribbin's latest book, The Omega Point *(Bantam), describes the search for the missing mass, and the ultimate fate of the Universe.*

●Sometimes I think we're alone. Sometimes I think we're not. In either case, the thought is quite staggering.

R. Buckminster Fuller

●There is a coherent plan in the universe, though I don't know what it's a plan for.

Fred Hoyle

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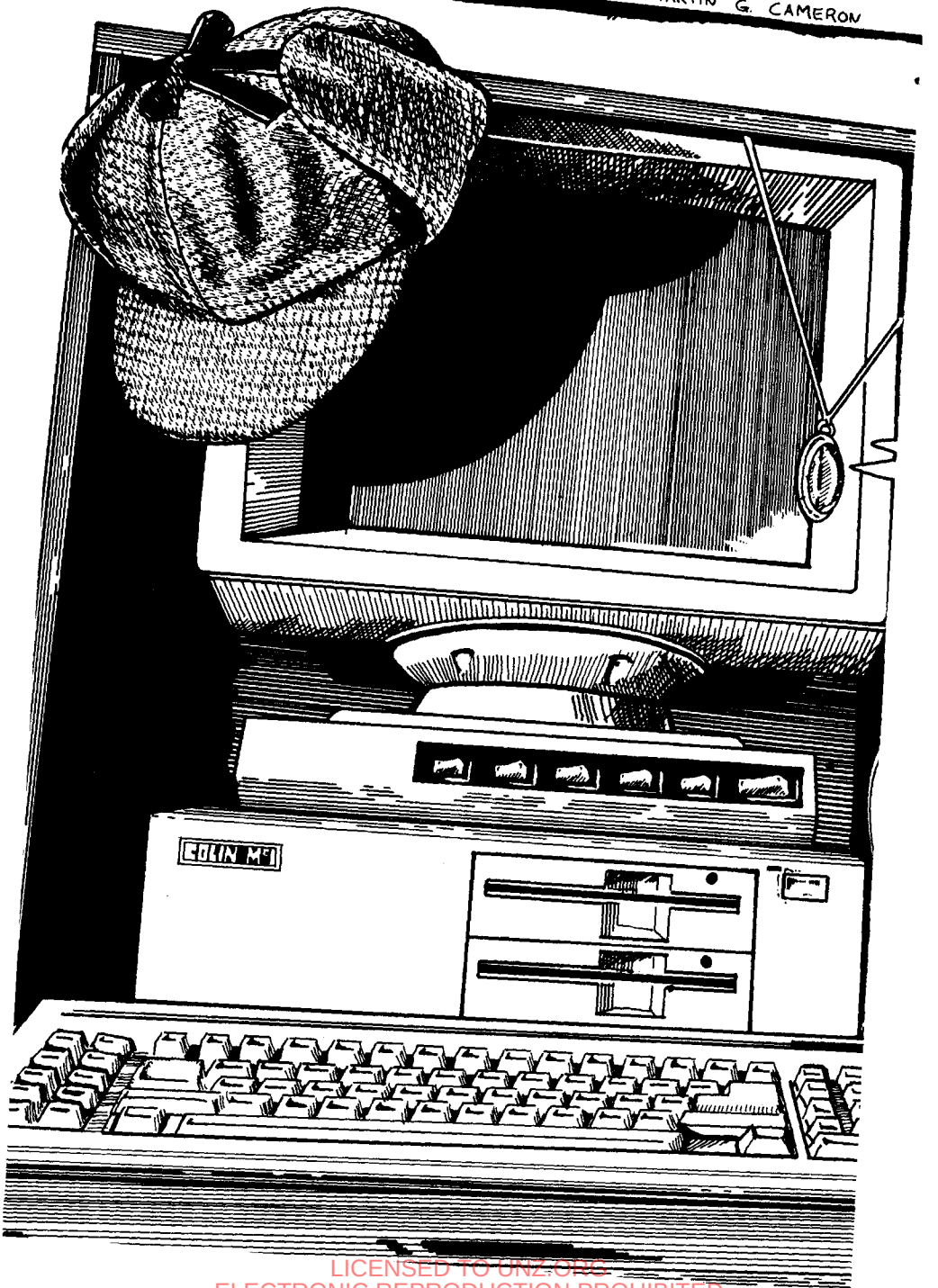

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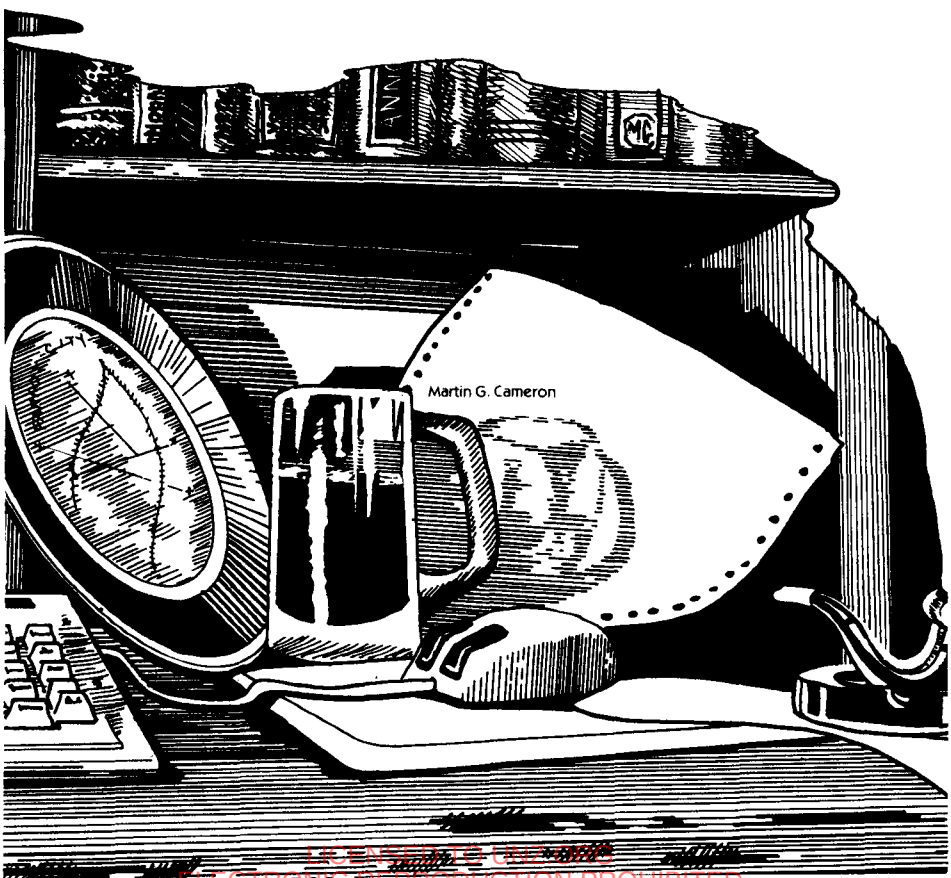
THE LONGFORD COLLECTOR

Michael F. Flynn

There's nothing like a good assistant to make a job easier!



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There was a ceili in the parlor and a hooley in the kitchen. Half the cousins were out front kicking up their heels to the music of pipes and fiddles, while the other half were in the kitchen drinking and talking. Jamie Shaw was one of the latter. For the drinking, he used Guiness Stout cut half and half with Harp Lager; for the talking, he used his favorite topic: his new expert program DETECT. The cousins all claimed he had the most marvelous sort of mouth. He never opened it without something going in or something coming out. And as often as not, that something would prove disconcerting.

"You never know just what bit of obscure information will help you crack a case," Jamie told his audience. "Just last month, for instance, I helped a client recover some money that had been stolen from her; and the solution to the case hinged on the fact that you can't ride the railroad into Grand Central Station in New York." He stopped and took a slug of his black-and-tan.

Harriet Locke frowned and took the bait. "Wait a minute! How can you say that? *I've done it!*" She brushed a stray wisp of hair from her face and jutted her chin belligerently.

Jamie shook his head. "No, Harriet," he told her, "you rode the railroad into Grand Central *Terminal*. That's it's name."

"Semantics," she groused. "What's in a name?"

He pursed his lips and looked at the ceiling. One or two of the others also looked up, as if they expected to see something there. "What's in a name?" he wondered aloud. "Quite a lot, as Romeo and Juliet discovered. You see, there *is* a Grand Central Station. On the Queensboro and Lexington *subway* lines. So . . ." He waved his free hand. "Well, the details of that particular case don't matter. The point I was trying to make is that, when we mined that particular bit of railway lore from Uncle Ken and put it in DETECT's knowledge base, we had no idea it would ever prove useful."

Bob Shaw made a sour face. "The private detective business sure has come a long way since Sherlock Holmes's day. Now, everything is on computers. I'm not sure I like that."

Jamie refilled his glass. The black stout bubbled and foamed into a frothy head. The Irish claimed that a well-fed mouse could walk across the foam made by Guinness Stout. He wondered if anyone had ever tested that hypothesis. Probably not. No Irishman would waste a good drink that way. "Actually, it hasn't changed all that much," he told them. "Remember how Holmes would operate? No matter how obscure the subject matter, Holmes was an expert. Invariably, he had 'written a monograph' on the subject. One glance at some tobacco ash or a soil sample was all he needed. Well, in the real world, no one knows that much about that much. That's why I decided to build an expert program. There was no way I could carry limitless knowledge in my head, so I created an extension for it."

"Jamie, if your head were any more extended, we couldn't buy hats for you."

He turned and greeted the newcomer. "Hi, Sandy. How's my silent partner?"

Sandra Locke kicked him in the shin. "Don't give me any of that bull. I heard

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what you said. 'I decided to build. . . .' 'I created. . . .' You want to tell them who did the *real* work?''

''I did. Ow! It hurt that time. No, really. I did the real work—the planning, the supervision. . . .'' There were derisive hoots from all quarters. ''I was in charge of the Big Picture,'' he explained. ''Sandy just did the grunt work.''

Harriet shook her head. ''You two are living proof that relatives should never go into business together. Especially computerized detective work. But, tell me, what did you mean before, when you said 'expert program' and 'knowledge base'? Didn't you mean 'data base'?''

Jamie looked at Sandra. ''Sandy? That's your half of the partnership. I've got to finish this drink before I lose my head.''

''Too late,'' sighed Bob.

Sandra coughed self-consciously. ''Well, I don't want to give a lecture. . . .''

''But you will,'' Harriet said. They all laughed.

''But I will,'' she agreed. ''Basically, we're talking about fifth-generation computers.''

''Oh,'' said Harriet. ''Well, that settles that.'' There was more laughter.

''No, seriously! A data base is just that. Data. Facts. But, as the statistician, W. Edwards Deming, once said, figures by themselves provide no information, have no meaning, no interpretation, in the absence of theory. In short, facts are no substitute for knowledge. Knowledge is how you *handle* facts. Harriet, let's say you visit one of your patients. You look at the chart. What does it tell you.''

Harriet pursed her lips and nodded. ''I think I see what you're getting at. It tells me facts: patient's history, blood pressure, temperature, things like that.''

''Right,'' Sandra agreed. ''And those facts are the same for everyone. But there's a difference between what happens when you look at the chart and when, say, Jamie here looks at it. And that difference is . . .''

''Malpractice?''

''Knowledge,'' said Sandra, firmly. ''An expert like yourself can take those facts and draw conclusions.Conclusions based on things you learned in med school, from other doctors, from experience, from the journals. In short, you'd apply . . . '' She hesitated, bit her lip, then took the plunge ''. . . .a heuristic inferential program.''

There were groans all around the kitchen and a few cries of ''Jargon! Jargon!'' Sandy waited them out patiently. A knowledge engineer learned patience if she learned nothing else.

''Building an expert program,'' she said when they had quieted, ''means discovering how human experts draw conclusions. How do we know what we know? How does a lawyer know how to build a case? Or a geologist where to drill for oil? Then we convert that expertise into an algorithm. That's why I've been interviewing all the relatives. Our family is so large, it includes nearly every sort of expertise. Not *everyone* knows all the different kinds of tobacco ashes: but *someone* does. All we have to do is find that someone. Once the knowledge is algorithmed, the expert

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program takes us through it by means of a series of prompts."

"Human expertise isn't that simple," complained Bob. "How can you reduce *my* job to an algorithm? It can't be done! Lord, I don't know myself how I can tell whose paintings will sell and whose won't."

Sandy smiled at him. "Give me a month of your time and you will—and you'll be a better art dealer for it. Human expertise *isn't* simple; but I never said the algorithms were, either! They can be very, very complex; but a good knowledge engineer like myself can construct them. We'd use the 'extensive' method. I'd point to a painting and ask if it were any good. You'd tell me and I'd ask why. You'd say it was 'too busy,' or something like that; and I'd say, 'what's that mean?' And so on into the night. By the end of it, we'd both be exhausted; you'd hate my guts, and I'd have a network of decision trees to work from."

Bob was about to say something, presumably waspish, but Harriet interrupted him. "Then, who did you interview for DETECT?" she asked. "Jamie is the only detective in the family, and he hardly qualifies as an expert."

"Why, we interviewed Sherlock Holmes himself," Jamie replied. He had a foam moustache around his lips, which he proceeded to lick off.

"What my addle-witted partner means," explained Sandra, "is that we analyzed detective literature. And real-life detectives, too, of course. Living and dead. Like Charles Schwar, who started the Missing Persons Bureau of the Philadelphia police force back in the 1920s. He had a genuine knack for finding runaways. He could stroll down Market Street and pick them out just by watching their behavior. We wanted to find out *how* people like Schwar do what they do! But we also studied the great fictional detectives: Rabbi Small, Father Brown, Charlie Chan, Lord Darcy, Matthew Scudder, Nero Wolfe. . . ."

"Nero Wolfe! He was my favorite," said Jamie. "That's my idea of a detective. He sits in his brownstone all day, drinking beer and tending his orchids. Any legwork he needs for details, he sends out his assistant, Archie Goodwin. DETECT is going to be my very own Archie Goodwin."

"Jimmy," said Bob. "You'd love any job if there weren't work involved."

"You know who was a big help putting it together?" Sandra asked. "Caitlin."

Harriet was startled. "Caitlin? Our Caitlin? The Emerson Professor of American Literature Caitlin?"

"The very same," said Sandy. "Another expert cousin. Who do you know better able to do textual criticism? Genre fiction is one of her specialties. I couldn't interview Henry the Waiter, so I did the next best thing. Caitlin helped me separate genuine detective expertise from the literary gimmicks."

Bob chuckled. "I've heard of high tech being used in literature; but this is the first time I've heard of literature being used to develop high tech."

They stopped talking and listened as the ceili band in the parlor segued through *Colonel Rodney* and *Harvest Home* into a new tune. Bob began to tap his foot. Jamie frowned, looked

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around the kitchen. Cousin Frank, the physicist, claimed that every kitchen had a black hole because everyone at parties eventually drifted into it. "Say, has anyone seen great-uncle Tim?" he asked.

"Tim?" Sandra craned her neck. "No, I haven't. What made you think of him all of a sudden?"

Bob said, "The band's playing *The Longford Collector,* aren't they?" He chuckled. "That fits uncle Tim to a tee. He's a collector."

"He told me he'd be here," Jamie said. "He probably got so immersed in his collection he forgot the time." Sandra looked puzzled and he explained. "He collects railroad china," he told her. "Spends hours arranging his pieces, corresponding with other collectors, going to auctions or second-hand stores."

Sandra shook her head. "To each his own, I guess."

"Come on, Jamie," said Harriet, "Let's you and me go collect *him*. He only lives four blocks away."

"Sure," Jamie replied. "He plays the tin whistle and that crowd in the other room needs him badly."

Great-uncle Timothy Haggard O Neill lived in an old carriage house set at the back end of a lot on Chestnut Street. A high brick wall with a wrought iron gate surrounded the house and yard. The tree-filled yard effectively blocked the streetlights at night and muffled the sounds of the traffic by day. Creeper vines covered the walls of the two abutting townhouses, concealing the distressed brick under a leafy tapestry. Once through the gate, Jamie reflected, it was almost possible to forget that you were in the middle of Center City.

Harriet walked ahead of him along the flagstone path that wound its way through the yard. Formal flower arrangements bordered the walk. One of them was a "floral clock" using genetic strains developed at Cook College, the agricultural school of Rutgers University. Each of the species in the circle bloomed at a different time of day. Jamie looked at it and scowled. He tapped Harriet on the back.

"Hey, someone's trampled on Uncle Tim's clock," he said, pointing to the flattened blossoms.

Harriet looked. "Probably a delivery person too impatient to walk around on the flagstones," she suggested.

Jamie stooped and studied the arrangement. "Maybe. Whoever it was only took the shortcut when he left, at about three o'clock this afternoon. And he was running."

Harriet looked startled. "How do you know that? And how do you know it was a he?"

"You're right. It could have been a woman wearing a man's size ten shoe; but I wouldn't assign that scenario a high probability. But I know he didn't go *in* this way. Do you see which way the twigs bend? And the direction of the footprints? And look how the toes are so much deeper than the heels. That, and the distance between footprints, shows he was running."

She nodded. "Okay, you're the new Sherlock Holmes, all right; but how did you know what the time was. . . . Oh!"

"Elementary, my dear Watson. The three o'clock flowers were blooming when he stepped on them, but the four

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o'clocks were not." He stood and brushed off his knees.

The front doors were of finely carved dark oak. On one hung a heavy brass doorknocker in the shape of a lion's head, like Scrooge's in the Dickens story. Harriet lifted it and rapped three times. The sound echoed from the hallway inside.

Jamie clasped his hands behind his back and rocked back and forth on his heels. Insects chirped in the garden. Crickets, he thought idly. After a while, Harriet knocked again.

"Maybe he can't hear it," he suggested.

"I wish he would have a doorbell installed." She rapped louder. "Maybe he's not home."

"Light's on in his study," he said, nodding at the bay window at the far end of the house. "He's probably in there. I'll go knock on the window."

"Don't do that. You'll give him a heart attack."

"Not to worry. I'll just peek to see if he's in there."

When he reached the other end of the house, he found that the windows were too far off the ground for him to look in. He jumped as high as he could, but could see nothing in the brief glimpses he had at the top of his jumps; so he decided to climb the wall.

The wall of the house was dark brick and some bricks had been set so that they protruded slightly here and there. Jamie used them as hand- and footholds. They were not very secure perches—they protruded at most a half an inch from the wall—but Jamie was now determined to reach the study window. Behind him he heard Harriet bang the doorknocker again.

When he was level with the bay window, he reached out his left foot and steadied himself on the sill. With his hand, he grabbed hold of the jamb and carefully edged his head around to look in. *If Uncle Tim looks up now, he'll have a heart attack for sure.*

When he did get a good look at the study he was so startled he lost his balance and fell to the ground. He lay there for a moment, the wind knocked out of him. "Damn! Harriet!" He fumbled himself to his feet and sprinted to the door. "Harriet!" He reached her and grabbed her arm. "Something's wrong in there," he said urgently. "Uncle Tim's lying on the floor; and he's not moving."

Harriet looked at him and covered her mouth with her hand. "I didn't bring my bag."

Jamie searched the ground around the building. He found a rock about the size of his two fists. He picked it up and cocked his arm. "Stand back," he warned Harriet, and threw it through the side window to the right of the door.

The glass shattered, leaving dagger-like shards lining the pane. He stripped his sweater off and wrapped it around and around his left hand. Then he knocked off the shards, one by one. He was careful to do the top of the pane first and he didn't shove his arm all the way through. He didn't want a piece of glass to fall and amputate his wrist. He had seen what happened to people who jumped through glass doors and windows and had once tried to sue a television network for showing movies that implied it could be done safely.

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"Was he like that when you first looked in?" asked Harriet. "Lying on the floor, I mean."

"Yes, I didn't scare him, if that's what you're trying to imply."

"No, I—"

"Don't bother me." He climbed through the window frame into the hallway. His feet crunched on the broken glass. The hallway was dim, the only light coming through the study doorway at the far end. He opened the front door and let Harriet in. She rushed past him, to the telephone on its stand in the hallway.

"I'll call Sandra and have her run over here with my bag. *Damn!* I never go anywhere without it. I *never* forget to bring it with me."

Jamie didn't bother to reply. He ran down the hall to the last door on the left. When he reached the doorway, however, he stopped abruptly and braced himself against the doorjambs. He closed his eyes and hung his head. "Never mind your bag," he called to Harriet. "It's too late. Call the police."

He swallowed and took two deep breaths. Then, carefully, he looked over the scene. His eyes darted around the room, seeing everything. There were three pieces of china sitting on the broad wooden desk. There were glass display cases, all of them shut tight, lining the room. There were books and catalogs lying askew on the desk; three of them had fallen to the floor. There was a heavy brass bookend on the floor, its end dark and wet.

There was Uncle Tim next to it, his eyes open, looking through Jamie and not seeing him; and a copper-smelling pool of blood, already dry and crusted, staining the shag carpet around his head.

"There's no rush, either," Jamie said.

"I *know* it was murder," said Mike Shaw. He fingered the buttons on his uniform and brushed at some imaginary lint. He looked at his brother and cousin. "The question is, Who did it?"

"No," said Jamie. "The question is *why?* Uncle Tim was such a harmless old coot. His china collection was his only passion. If we knew *why* someone would want to kill him, then we'd probably know who, as well."

Mike scowled. "I know I'm only a policeman; but I don't think that's necessarily true. Sometimes there is no 'why.' Just punks looking for thrills."

"Maybe," said Jamie. "But doesn't that sort usually vandalize the place as well? We need to approach this from all angles."

Mike turned his eyes up to the ceiling. "I hear a 'we.' He's saying 'we.' I don't have enough problems, they want me to give them official police information on an open case." He looked at them. "Listen, little brother, you don't have any official standing. You're a private detective—"

"—private inquiry agent."

"—but you don't even have a client!"

Sandra spoke before Jamie could answer. "Tim was our uncle. We take care of our own. You know that. Step on one of our toes and we all come running. Remember when they had you pegged for that missing cocaine in the evidence room?"

Mike sighed. "Yeah, yeah, I know. I must be crazy, but I'll keep you posted

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on whatever we find. But, Jesus, Jimmy, be discreet, will ya? A hassle from the sergeant I need like I need another hole in my head, which he *would* give me, but not in my head."

"Burglary," said Sandra. They looked at her and she explained. "Somebody broke in to rob the place. Uncle Tim surprised them; they panicked and clobbered him."

Mike shook his head. "Nothing was taken," he said. He pulled a small notepad from his breast pocket, flipped it open and consulted it. "Here's the inventory. . . ." He glanced up and saw them grinning. "Awright, awright!" he said. "So I knew why you asked me t'come here and I asked Steve DeCapo for his notes he took at the scene. You don't have to look so smug."

"Smug?" said Jamie. "Who's smug? Do I look smug?"

Sandra shushed him. "Go on, Mike."

"Dining silver, all accounted for. Four hundred dollars, cash, in a bureau drawer. Credit cards, in his wallet. All of his railroad china, in display cases, except three pieces that were on his desk. There were three empty holders in the second case from the left." He flipped the notepad closed and challenged them. "If it was burglars, what'd they take?"

"They were panicked. After Tim surprised them, they ran without taking anything."

"Not 'they,' " Jamie reminded them. "There was only one man. He wore a size 10 shoe. He used the path when he arrived, and ran across the flower beds when he left, sometime between three and four in the afternoon."

Mike flipped through his notebook again. "Yeah. That's what you told Steve and the detectives. They would have found that out, too. We've got forensic scientists on the force, you know." His voice sounded hurt.

"Wait a minute," said Jamie. "We're doing this wrong. Sandra? You know my methods."

Mike looked a question at Sandra. She twisted her mouth. "He's feeling Sherlockian. . . ."

"That's 'Shaw-Locke-ian'."

". . . and wants to pretend he *has* methods. Actually, he's right. We do have a generalized problem-solving algorithm in the system architecture. What we do is generate theories through brainstorming . . ."

"Theories. You mean like your panicky burglars," said Mike.

"Right. Or your thrill-seeking punks. We put the theories on an Ishikawa cause-and-effect diagram. Then we lay out the symptoms on a K/T matrix and see which theories fit the symptoms." She swiveled in her seat and activated the terminal. The screen brightened and the equipment began to mutter to itself as it set up the operating system.

"I see. Like the burglar theory doesn't square with the fact that nothing was taken. Or the thrill-killers with the fact of no vandalism."

"That's the general idea," she said absently, concentrating on the terminal.

"Fine. But what if you don't know all the facts? All the symptoms, as you called them."

"Then we go out and dig for them," said Jamie. "The C&E Diagram and the K/T Matrix tell us what facts to look for."

Mike shrugged. "That's just sounds

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like good police procedure to me. Heck, Jimmy, I don't need a computer or any fancy algorithm to tell me what to do."

The doorbell rang and Sandra looked up from the console. "That'll be Harriet. We asked her to come, too."

"Oh? The police force doesn't have a pathologist?"

"Take it easy, Mike," Jamie said on his way to the door. "It's a Family matter, right?"

When Harriet was settled in, the three of them pulled their chairs into a semicircle around Sandra. Sandra sat at the terminal console and explained how things worked. "We'll begin with the facts of the case. Details. About Uncle Tim. About the scene of the crime. About the murder method. The expert program will prompt us with questions." She pressed a button.

<PLEASE ENTER TYPE OF CRIME.>

<MURDER>

<NAME OF VICTIM?>

<TIMOTHY HAGGARD O NEILL>

<IDENTITY = "UNCLE TIM"?>

Jamie was reading the screen over Sandra's shoulder. He blinked when he read that. How the hell did the program know to ask *that?*

Sandra, anticipating his question, whistled. "That's one heck of a program I wrote. It must have accessed Cousin Frank's geneology file, compared the names, and come up with a possible identity." She typed <YES>.

<IS PHOTOGRAPH OF VICTIM AVAILABLE?>

<YES>

<PLEASE INSERT IN SCANNER . . . SUBPROGRAM RUNNING>

"I'll handle it," said Jamie. "I've used the scanner before." He took a photograph of Uncle Tim that he had dug up and inserted it in the Imagewriter. "The scanner program works the printer in reverse," he heard Sandra explain to the others. "Instead of putting pixels out, it reads them in. There's a 3-D program with a human body matrix resident in the system. DETECT will take the digitized image of the photograph and turn it into a three dimensional one. Meanwhile, we'll continue. The scene of the crime is next." When he had the photograph positioned properly, Jamie pressed <START>. When he returned to the CPU, Sandra had a grid system on the screen.

<PLEASE SHOW LAYOUT OF MURDER SCENE. INDICATE DIMENSIONS IN METERS (PROGRAM WILL SCALE). SELECT FRAME FROM MENU.>

Sandra selected "Room" from the menu and a generic rectangle appeared on the grid. Using the mouse and the menu of drafting tools, she began modifying it. She moved walls; inserted lamps and chairs; positioned the desk; altered their sizes. When she wasn't sure of a location or dimension, she asked Mike and Mike would consult his notebook and tell her. Sometimes, they had to guess.

<POSITION BODY.>

An outline of a human form, male and approximately to scale, appeared in the center of the diagram. Since he had found the body himself, Jamie reached over Sandra's shoulder and took the

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mouse. He clicked on the body and moved it to where it had lain. Then he clicked on the head and limbs and rotated them into position. He opened the eyes. An odd feeling stole over him as he worked. He felt as if he were recreating the scene of the crime; as if he, himself, were reliving that awful moment in the doorway. He knew what was coming next and dreaded it.

A three dimensional image of Uncle Tim, generated by the subprogram, replaced the generic outline. The face looked out from the screen, as if on a television monitor. Jamie heard Mike suck in his breath.

<INDICATE FORENSIC DETAILS. SELECT FROM MENU>

Sandra scrolled <MURDER WEAPON>, then <BLUNT INSTRUMENT>, then typed in <BOOK END>. "You'll have to help out here, Harriet," she said. "It's going to ask about the site of the wound, how deep it is, and so on."

Jamie stepped aside to let Harriet in. Harriet settled herself in the console chair. "You work that mouse gadget, Sandy," she said. "I'm not used to those things."

They worked on the forensics for hours. **<BLOOD TYPE: STAIN.>** **<BLOOD TYPE: VICTIM.>** The program prompted them for detail after detail. **<MATERIALS FOUND ON BODY?>** <PLASTIC FRAGMENT, WHITE, IN VICTIM'S RIGHT JACKET SLEEVE.> Even Mike had to admit it was thorough. **<MATERIALS FOUND BY VACUUMING RUG?>** <NONE.> Even if most of the details eventually turned out to be irrelevant, it made for a helluva checklist. **<LAST PERSON TO SEE VICTIM ALIVE>** <HOUSEKEEPER; MRS. GONCHAR; 2:30> It even asked about tobacco ashes and soil samples; and Jamie had the grace to blush.

By the time they had finished, the pizza they had ordered had arrived. "What happens now?" Mike asked as he carried the pizza boxes into the kitchenette and set them on the counter.

"Now nothing," Jamie told him. "We take a break. Which one has the anchovies?"

They started toward the kitchenette, but were abruptly halted by the humming of the printer. They all turned, surprised. Jamie noticed that even Sandra had her eyebrows raised. Slowly, a piece of paper emerged from the laser printer.

Jamie looked at Sandra and Sandra looked at Jamie. "What is it?" he asked.

"A printout," she answered.

"I can see that. But a printout of what?"

"How should I know? I haven't read it."

"It's your program!"

"Sure; but there are so many subroutines and contingency programs and—"

"Are you two going to argue all day about what it might be or is someone going to go over and read the son of a bitch?" Mike looked ready to leap over the counter himself. Jamie was closest to the printer, so he fetched it.

"What is it?" asked Mike.

"It's a description of the murderer," he said slowly.

"It's a what?!"

"A description. You know. Height,

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weight, color of hair and skin. That sort of thing."

"I know what a description is. Where did that bag of chips get one?"

Jamie pursed his lips. "I'll let Sandy handle that one," he decided.

"Meaning he doesn't know," she said. She took the sheet from his hands and perused it. "It gives probabilities and 95% confidence intervals for the description. Weight is given as 163 ± 5 lbs., for instance. And there are three sketch-scenarios of how the murder might have taken place. I think it must be based on inputs like the location and severity of the wound, the angle of penetration, the size and depth of the footprint, and so on. It assigns a low probability to a left-handed perp, for example, because a left-hander would have had to deliver the blow backhanded; and, if that were the case, it wouldn't be so deep, unless he were a heavy set individual, over 200 pounds, and that doesn't jibe with the footprint."

Mike made a disgusted sound. "Give me a break! Now I know we shouldn't look for scrawny left-handers?"

Jamie flushed. "Well, that's what DETECT said."

"Oh, fine. That eliminates maybe 10% of the population of Philadelphia."

"Well. . . . It didn't say the perp lived in Philadelphia."

"Ten percent of the country, then. Hey, we're *really* making progress now. We only got, what? Two hundred some odd thousand suspects. Unless you want to include the rest of the world? What else does your computer say?"

"Uh, the perp was a white. Skin sample from under the victim's fingernail showed that." He flushed. Of course, the police already knew that, too.

Mike laughed.

"Look, it's just a computer program, Mike. It doesn't have *judgment*. All it's doing is exploring all the branches of its decision tree. It's an *aid* to human judgment, not a replacement for it."

"Hasn't been much aid so far."

"Oh, I don't know," said Harriet judiciously. "It does put *some* physical limits on the killer. You really can eliminate scrawny left-handers. That may not be much help, but at least it's something."

Jamie ate his pizza in silence, enduring his older brother's flippant remarks. Granted, DETECT had not cut such a great swath so far; but then he had never used it on a case this complex before. Like Sandy had said, there were parts of the system design that even she wasn't sure of. And any new system had bugs. He just hoped DETECT wouldn't embarrass him any further.

Finally, he wiped his mouth with a napkin. "Time to lay out the motives," he announced. They trooped back to the console: Mike, reluctantly; Harriet, with some curiosity.

"What the hell?" Jamie stopped and stared at the screen. It was covered with an intricately branched Ishikawa diagram.

"What's that? It looks like a tree," said Harriet.

"It's a cause-and-effect diagram," Sandra told her. Jamie could hear the puzzlement in her voice, too. They were supposed to input the entries on the diagram; but the program seemed to have generated scores of them all by itself. A prompt was flashing in the lower right

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corner. <**ADDITIONAL MOTIVES?**> Jamie peered more closely at the screen.

The trunk was an arrow, pointing at the problem statement: <UNCLE TIM KILLED.> Off the trunk were the main branch diagonals: <JEALOUSY>, <RAGE>, <SELF-DEFENSE>, and so on. Twigs and sub-twigs branched off of these. Off of the <JEALOUSY> branch was a twig reading <SPOUSE OF LOVER> with sub-twigs reading <HOMO> and <HETERO>. He began to laugh.

"I get it," he said. "It's a generic murder diagram. It's got all possible motives on it. The classification is straight out of that Father Brown mystery, *The Man with Two Beards*. This is all stuff already in the knowledge base."

"What good does that do?" growled Mike. "This ain't a generic murder. It's Uncle Tim."

"Easy," Sandra answered him. "Now we just cross off the motives that aren't possible."

But before she could touch the mouse, X's began appearing across some of the entries. "Or," she continued breezily, "DETECT can do some of the crossing out automatically." She looked sheepish. "Sorry, Jamie. I do remember writing *this* routine. It's comparing the motive list against the forensic input, and eliminating everything the input makes impossible."

Jamie looked at the screen. He was beginning to feel something of what Mike felt. Computers were thorough. The problem was that they were *too* thorough. No intuition. They had to look at *all* the possibilities. *Like I need a computer to tell me that Uncle Tim wasn't knocked off by the KGB because he was a double agent.* He pointed to the screen. "What are those numbers appearing next to the other branches?"

"Probabilities," Sandra answered him. "DETECT is telling us which motives are most likely to be worth investigating."

Jamie nodded. "Sherlock Holmes always said that when you have eliminated the impossible, whatever's left, however improbable, must be the truth. I guess that's how a computer would apply that maxim. With probabilities. Sandra?"

"What?"

"Where is it getting these probabilities?"

"Out of its electronic arse," said Mike.

"No," said Sandra seriously. "It's like the weather. . . ."

"That reliable, hunh?"

Jamie rarely saw Sandra lose her temper. Now her lips thinned and she turned on Mike. "Don't be ignorant, cousin! Try comparing weather forecasts with reality sometime to find out how accurate they really are instead of repeating tired old chestnuts. When a weatherman says there's a 50% chance of rain, she means that, in the past, whenever a particular weather pattern has been observed, rain has followed about half the time. I used the same logic in setting up this subprogram. In X% of past murders that followed this pattern, the motive was A. That's all it means. In fact, I think you have a word for it."

"What's that?"

"Experience."

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"Look," said Harriet. "Can we cool it here? Mike, Jim and Sandy asked us here to provide input for their program. That's all. This is their company and you have no right to mock the way they do their job, no matter how silly it . . . seems. I know you don't like the idea of a computer doing your thinking for you. But it's *not!* It's just listing possibilities. The kind of notes you might jot to yourself. Reminders. Check this out. The fact that it also lists things you would never bother writing down in the first place is trivial. And you two . . ." She turned on Jamie and Sandra. "Why can't you keep your gadget in perspective? Sure, it may be useful someday. After years of development. But you've been touting it as the greatest thing since sex on white bread. You've automated some of the donkey work, certainly; but you've got to admit that the mountain has labored and brought forth a mouse."

When Mike and Harriet had gone, Jamie sat himself on the edge of Sandra's desk.

"Well, sport? What do we do now? Your program wasn't much help, was it?"

"*Et tu, Brute?* I never promised it would do miracles. You said yourself it was an electronic Archie Goodwin; something to do research. I never told you it would give you a printout with the murderer's name and address, did I?"

"Well, no."

"And I never promised a printout that would spell out every detail, right?"

"Right."

"Then I'll tell you."

"Tell me what."

"It just gave you another printout."

"Another what?"

"Another printout."

"Where?"

"Where do printouts usually come, in a shoebox? Look behind you, in the laser printer tray."

He turned. "There's a printout there!"

"I never cease to marvel at your keen powers of observation."

"What does it say?"

"Are we going to go through that again?"

He leapt from the desk and hurried to the printer. He read through it quickly.

"Darn! You were right."

"What?"

"It doesn't give the killer's name and address."

She sighed. "What does it say?"

"Item 1: Determine polymer structure of plastic fragment found in victim's sleeve. Item 2: Scan Luckin into DETECT's data-base."

"Luckin?"

"Luckin."

"What's a Luckin?"

"Luckin is the railroad china collector's Bible. It lists the patterns issued by every railroad in the U.S., year by year, complete with photographs. A fellow named Dick Luckin wrote the book, oh, years ago. He was a serious photographer as well as a collector. Uncle Tim showed it to me one time. It's in his library."

"Then the program must have assigned a high probability to Uncle Tim's hobby being connected with his death." She picked up the copy of the Ishikawa diagram and looked for it. "Yep. Here

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it is. <THEFT; PLATE FROM COLLECTION; 87%>''

''But that doesn't make sense! Mike said nothing was missing. No empty spots in the display cabinets, remember? And railroad china isn't that valuable, anyway. I asked Tim about it one time. He laughed and said that no one collected railroad china for its monetary value. That was the fun of it. So if DETECT is thinking of some porcelain version of the one penny orange, forget it.''

On Monday . . .

Jamie entered the office and found Sandy already at work. She was doing something with the modem. Blocks of figures flashed across the screen, too fast to make out. Jamie decided she was downloading something into the knowledge base.

''Hi, Sandy. How's your baud?''

Sandy looked up at him, shook her head sadly, and bent back to her work. ''Make any breakthroughs on Uncle Tim?''

''No, dammit,'' he said throwing himself into his desk chair. ''And the police are stymied, too. Mike says they're leaning toward the teenage thrill-killer theory. I have some of our Irregulars doing a door-to-door and I went to the neighbors' houses myself. No one saw anything; no one heard anything. But something will come up. Meanwhile . . .'' He rummaged around on his desk top, looking for a microfloppy he had left there. This was akin to finding a lost wallet in the aftermath of the San Francisco earthquake. It was a tribute to his persistence and dogged determination that he did find the disc within a finite period of time. ''Are you going to be off soon?''

''Almost done. Why?''

''I might as well let DETECT work on this embezzlement thing.''

''What embezzlement thing?''

''This one.'' He held up the disc. ''Reilly, Silver, & Goldman, the money fund people. They think one of their people is siphoning.''

''You're still willing to use DETECT?''

''What? Sure! This one is a piece of cake. The records are all here,'' he said, tapping the disc. ''It's just a matter of tracing all the transactions. When I told the general manager we had a smart computer, he fell all over himself with gratitude. They weren't set up for that kind of thing. The whole thing is tailor-made for our electronic Archie here.''

He sat himself at the console and cracked his knuckles. ''Under the fingers and under the thumb. Look out embezzler, here I come!'' He activated DETECT, inserted the disc, and waited for the prompt. The screen lit up: **<READY TO SCAN LUCKIN.>** The microfloppy ejected.

''What is this?''

Sandra came and looked over his shoulder. ''Why, it's still running Uncle Tim. There must be an open loop in the program. Let me try.'' She took his seat and played some arpeggios on the keyboard, scowled at the results, played some more. Jamie waited for a while, expecting quick results; but it soon became clear that the troubleshooting would take some time, so he wandered off to his own desk.

A half hour later, Sandra blew her breath out, shoved her hair away from

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her face, and pushed back from the console. Her chair rolled across the room to Jamie's desk, where he was sitting with his feet propped up, reading an old copy of *Analog*.

"I know how to fix it."

"Good. Go ahead."

"No. You have to do it."

"Do what? Fix it?"

"No. Scan Luckin."

"Scan Luckin?"

"Scan Luckin."

"I don't understand."

"Which word don't you understand? Scan? Or Luckin?"

"Both. I mean neither. I mean why?"

"Because, as simply as I can put it, DETECT is 'jammed.' You can't work any more cases through it until this one is resolved. If you want anthropopathism, I'd say DETECT is obsessed with the case."

"Anthropopathism?"

"Yes. It's something I do to you sometimes."

"It sounds lewd. If you weren't my second cousin . . ." He rubbed his hand across his face. "Oh, well. If that's the only way to unclog your program, I suppose I can give it an electronic enema. I'll hie myself over to the carriage house and hook the book. Be back in two shakes."

He stood to leave. Sandy stopped him at the door.

"And while you're at it . . ."

"What?"

"I better call the police lab and find out what that plastic fragment was made of."

On Tuesday . . .

They watched the printout snake its way from the laser printer. Jamie looked at Sandra. Sandra looked at Jamie. "I'm afraid to read it," he told her.

"Me, too."

The paper lay in the output tray.

"Well, it's not going to read itself to us, is it?"

He held up a hand. "Wait. Maybe it will."

She grabbed the paper; read it; and groaned. She handed it to him. He looked at it. And groaned. *Another* "action item." That made four in the last twenty-four hours!

"It wants a modem hook-up to the patent office?" he asked incredulously. "That on top of the one this morning to the airlines? And the list of all the local express and delivery companies? Why?"

"Oh, those don't bother me nearly as much as why it wants to read *A History of La Plata County, Colorado*."

"You know what I think? I think your computer's slipped a gear."

"It doesn't have gears."

"Then it's slipped a circuit."

"That's 'short' circuits."

"Okay. It's dropped its shorts and is giving us an electronic moon."

She tapped the printout with a fingernail. "Well?"

"Well what?"

"Are you going to follow up on this?"

"That depends. Wouldn't it be easier to erase the program and rewrite it?" A glance at Sandra's face showed that that was unlikely to be an optimal solution. He sighed. "How much longer is this going to go on? We're not making any progress on Uncle Tim's killer; and

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we can't use the program for other cases as long as it's 'jammed.' "

And on Wednesday . . .

He peeked in the office door and saw Sandra studying printout #9, so he closed the door carefully and scampered on tiptoes down the hallway toward the elevator, but the door opened behind him and Sandra called out.

"Aw, have a heart," he told her. "I just got back from doing printout #8!"

Sandra was not impressed. "We need to arrange a modem link-up with the delivery companies. Do you plan on hoofing it around to their offices, or do you want to come back and use the phone?"

Thursday.

"I don't know if Mastercard and Visa will cooperate!" Sandra complained.

"Look it's your program. Why it wants to read charge card transactions for southern Colorado for the last week is beyond me. But . . ."

"I know. I know. Maybe I can mouse in on the sly. I used to be a pretty fair hacker. I wonder why it wants us to check these particular forty-seven card numbers?"

Jamie scratched his head. "Gee, I was kind of hoping you knew."

Then it was Friday . . .

The light on the printer was blinking when Sandra opened the office up, which meant something had just printed. Jamie looked past her and saw it. "Not another one!" he wailed. "We've gone past comedy. This is slapstick." He grabbed the printout before Sandra could. He read it once. He read it twice. His jaw dropped.

"What is it?" Sandra asked.

"You won't believe it."

"Tell me."

"You won't believe it."

"What is it?"

He handed her the page. "The name and address of the killer."

She snatched it. "I don't believe it!"

"I told you you wouldn't."

"The killer is named Tobias Crane," she read aloud. "He is registered at the Strater Hotel, 699 Main St., Durango, CO. Room 101. Tickets have been reserved for you on Continental Flight 1101, connecting in Denver with UA3751 to Durango. You are booked at the Strater Hotel. Local police advised. Arrest will be coordinated with your arrival. Tell him you know he has the Parrott City Plate. He will confess when so confronted. Probability 92.3%."

Probability 92.3%? That had to be a joke!

"Hey, how did your friggin' program make plane reservations?"

"It probably tapped into your financial programs and learned your American Express card number. Then it linked directly into the reservation network. Ditto for the hotel and the rent-a-car."

He took the sheet back from her and reread it. The Parrott City Plate? He searched through his desk top until he located the copy of Luckin that he had taken from Uncle Tim's library earlier in the week. He flipped to the index, located a page, and read. "Son of a bitch," he said.

"Is it a secret, or can you tell me?"

"Listen to this. The Animas, Dur-

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ango & Parrott City narrow gage RR was never actually built," he read. "The Parrott City gold boom collapsed before construction started. However, investors had already purchased or commissioned most of the equipment and supplies, including the dining car china. No photograph of plate is available. Only one is thought to be in existence: a sample specimen. It is decorated with a map of Parrott City area showing the gold workings on Madden Peak, Mt. Baldy, and the La Plata Mountains, along with the proposed route of the railroad."

"Only one of its kind," mused Sandra.

"Yeah, but it's not particularly valuable. About $500, according to this."

"But there were no plates missing. The police checked against Tim's inventory. You know how painstaking he was about his collection. There was no Parrott City Plate."

"Sure. Tim didn't have the plate; it wasn't missing; and it wasn't worth anything. No wonder Crane took it. And where in the name of Sherlock Holmes did DETECT get Crane's name from? And his address, for crying out loud?"

She looked at the terminal. "If only we could ask it."

"Yeah. If only . . ."

"But, I never wrote a sub-program for that."

"Never wrote . . ."

They paused and looked at each other.

"Memory Dump!" they both said simultaneously.

Sandra leaped for the console and entered the command into the system. Lights flashed. Disc drives clicked. Within moments the impact printer began churning out reams of machine sheets.

They tore them off and read them as they emerged. Jamie looked at Sandra. Sandra looked at Jamie.

"So . . ."

"So . . ."

"So, no wonder it wanted the credit card hookup."

"After the airline business, it was the next logical step."

"Don't forget the history of La Plata County! That was the key."

"And of course no plate was missing."

"Because of the plastic fragment!"

"When does that flight for Denver leave? Can you be ready in time?"

"Are you kidding? I'm already gone!"

"In every great detective story," Jamie explained to the others assembled in his office, "there is a scene at the end where the great detective gathers everyone together and explains how he solved the case. It is now time for the *denouement*."

"And in lieu of the great detective, Jamie has called you here," said Sandra.

"Come off it, Jimmy," said Mike. "It was just dumb luck."

"Luck?" asked Harriet. "To pluck that Crane fellow out of nowhere like a needle from a haystack? What are the odds? You're just jealous, that's all." She turned to face Jamie and Sandra. "I can't help it. I'm impressed. How did you do it?"

"Elementary, my dear . . ." Jamie began.

Sandra interrupted. "It was DE-

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TECT. We couldn't have done it without DETECT. You see, most police cases are not solved by flashes of brilliant deduction—no offense, Mike; but you know what I'm talking about. It's sheer legwork combined with a bit of luck. The patient sifting through mountains and mountains of evidence that may or may not be significant. Well, that's what a computer does best; and it can do it far faster than an army of detectives. Take the checking of airline reservations . . ."

"Wait a minute," said Jamie. "Let's give it to them in logical sequence."

"Starting with the piece of plastic."

"Right."

"What was so important about that?" asked Mike. "A stray bit of plastic stuck by static electricity to his clothing? Big deal."

"As it turned out, it *was* a big deal. Tim was fastidious. He brushed his clothing every evening before hanging it up. If there was a fragment of plastic stuck to his sleeve, it must have gotten there during the day. How? He spent the whole day at home. The housekeeper had just vacuumed, so there was no place inside the house where he might have picked up a stray fragment of plastic."

"A chemical analysis of the plastic," said Sandra, picking up the narrative, "showed it to be a common polymer widely used as a packing material."

"Packing material," repeated Harriet. "Then. . . ."

"Right. Uncle Tim received a package the day of the murder, delivered by a company using the same packing material as was found in his pocket. Considering his hobby, it was probably a specimen for his collection. Question: where was this new piece? It wasn't in the display cabinets, because the pieces on display matched the inventory list, and no new item had been added to the list. We all thought that was evidence that nothing had been taken; but if a plate *had* been delivered, it pointed in the exact opposite direction. There should have been a new piece on display, but there wasn't. Conclusion. It was stolen. Along with the package itself, I might add. Why would Uncle Tim have hidden the package? The thief took it with him so no one would know it had arrived."

"Just guesswork," grumbled Mike. "The plastic might have been something else; and, even if it was a package, it might not have been a plate for his collection."

"Granted. But the probabilities leaned that way. And DETECT simply followed the decision tree down its most probable branches. Eventually, we did manage to verify the delivery through Federal Express and we contacted the sender, who verified that Uncle Tim had purchased the Parrott City Plate from an estate sale. But that was later. DETECT continued to list the most probable actions to take without waiting for corroboration."

"We all thought DETECT was crazy," Jamie admitted, "but all along it was doing the legwork needed to break the case. Once it had reasoned that a plate was missing and was in fact stolen the day it arrived, it looked through the Luckin catalog to see what might be worth stealing. There was only one piece that was unique: the Parrott City Plate. The other plates existed in such quantities that it made no sense to

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steal one. They could be purchased far too easily."

"But it wasn't particularly valuable," said Mike. "You said something about railroad china not being valuable. So why steal one even if it was unique?"

"It wasn't the plate itself that was valuable. It's what was on it. A map of the Parrott City area, showing where all the local gold mines were."

"And here," added Sandra, "was where the *History of La Plata County* came in. Most of those workings played out in the 1880s and 1890s. That's why the railroad was never built. But there was one mine that did not play out. That was Clubfoot's mine, which was later called the Lost Dutchman, because the Dutchman, who was the blacksmith in the town, handled all of Clubfoot's gold. It shut down when Clubfoot died. It was a lode that was barely touched and incredibly rich. The Dutchman probably meant to reopen it sometime, but the boom died and Parrott City became a ghost town. Now, neither the Dutchman nor Clubfoot was ever particularly noisy about the mine's location. In those days, it paid to be discreet about such things. In fact, it's called the *Lost* Dutchman because its location has been forgotten. But evidently the railroad people knew where it was and put it on their map. Now that the price of gold is over $400/oz. the location of such a wealthy lode is a great prize. Neither Uncle Tim nor the previous owners ever realized that, because their interest was in railroad lore and railroad china, and to them the map was simply a decoration."

"All right, all right. I'll grant you that," said Mike. "But how in the name of blue blazes did you ever pull Tobias Crane out of the hat?"

"Well, later on, the lawyers who handled the estate that sold the plate told us that Crane had also submitted a bid for the auction and that they had supplied him with Uncle Tim's address in case he wanted to purchase it from him. But that's not how we got onto him."

"Airlines," said Sandra.

"That's right. DETECT figured that the most probable course of action was that the killer had come to Philadelphia the day before the murder and flew out afterwards as soon as possible; and that he would most likely fly directly to Durango. A map on a decorative china plate is not exactly a geological survey map; so the killer would probably be hanging around the Durango area for quite a while pinning down the location before taking steps to secure title.

"So, my little program compared all the airline passenger lists, matching the names of those arriving a day or two before the murder with those leaving for Durango the night of the murder. Oddly enough, there were forty-seven possibles, since the program also considered flights to Cortez and Trinidad, as well as Durango.

"The next step was to take the credit card numbers of those forty-seven and see which ones were being used to buy camping and prospecting type gear in the Durango area. That narrowed it down to one man: Tobias Crane. After that, it was a matter of finding out where the man was staying, also through his credit card. Poor fellow saw no need to cover his tracks since there was absolutely no connection between him and his victim. He just never counted on me

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and my faithful assistant.'' Jamie beamed and patted the terminal gently. ''When we walked into the Hotel's Diamond Belle Saloon with the police in tow, he practically collapsed on the floor. He never intended to kill Uncle Tim. He had just come here to try to buy the plate; but Uncle Tim wouldn't sell. They argued and . . .'' He shook his head sadly. ''Things got out of hand.''

Later, after everyone else had gone, Jamie stayed behind to clean up. He wondered if Mike would admit the usefulness of Sandra's program now. Maybe. Maybe not. Never underestimate human pig-headedness. Especially the humans in the Shaw-Locke Family. Oh well. He was happy, and Sandra was damned near ecstatic. It was definitely a feather in both their professional caps.

He whistled as he filed the hard copies of their report and cleaned the coffee cups off the desks. He picked up one of the Styrofoam cups and studied it. Catching a murderer with a piece of packaging plastic. Incredible. That was better than Harry Kemelman's, *The Nine Mile Walk*.

He went to shut down the terminal, making a mental note to run the embezzlement case first thing in the morning. He didn't switch it off right away. Impulsively, he typed an entry: <GOOD WORK, DETECT.> It was a nonstandard imput. The screen began flickering. Great. Sandra will kill me if I screwed up the program. After a moment though, the screen steadied. <**THANK YOU, ARCHIE.**>

Jamie was halfway out the room before the meaning sank in. He turned and stared at the terminal. Just who had been doing the legwork for whom?

He wondered what DETECT used for beer. ■

● Science at best is not wisdom; it is knowledge. Wisdom is knowledge tempered with judgment.

Lord Ritchie-Calder

● Science is not a sacred cow. Science is a horse. Don't worship it. Feed it.

Aubrey Eben

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A SPECIAL OFFER

Bill Johnson

"When in Rome . . ." is generally good advice. But when carried to extremes . . .

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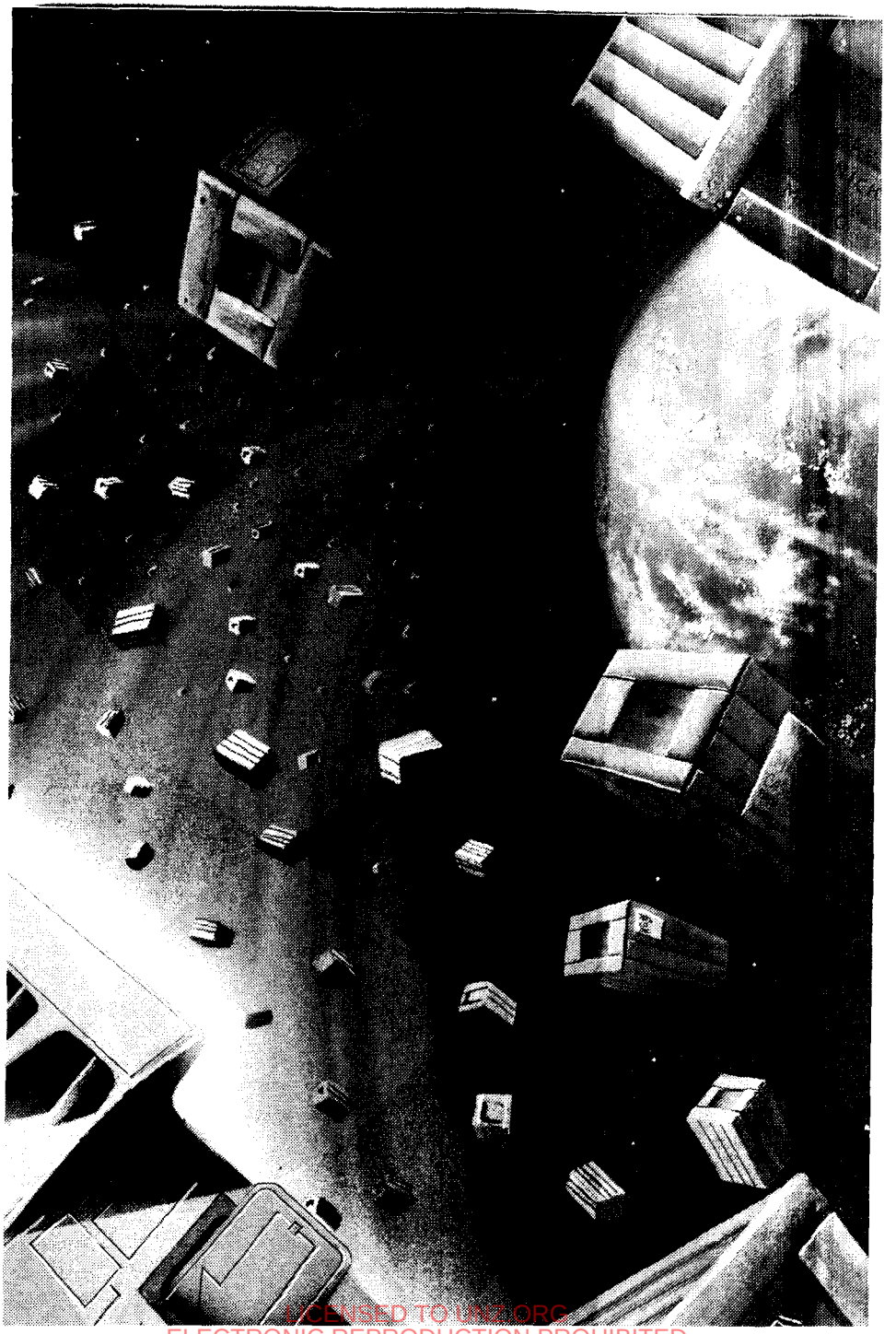

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I miss girls.

I also miss Chinese food, neon signs, the smell of gasoline, a crisp new suit from Brooks Brothers, and just about everything else you can think of. Except, of course, for snow, trees, mountains, and fresh air. I have plenty of those, thank you, and I'd trade them all for a good Chicago deep dish pizza.

I miss my phone.

Not that I could answer one if it rang. The pleasant young men who found me this hideaway made it very clear that I should assume every phone is tapped. And if almost anyone (except the pleasant young men and the governments they represent) found out where I was hiding . . .

"You, sir, are in a great deal of trouble," my boss said. He leaned back in his chair and smiled.

I didn't like it when my boss smiled. His teeth were perfect, blindingly white, the very best money could buy. They also reminded me uncomfortably of his reputation and my tenuous position with the department.

"Your uncle has done for you what I'm sure he thinks is a favor," my boss said. "Congratulations. You are now the new nursemaid to the Alvazoni."

I winced. I remembered when the aliens first arrived, and all the excitement as the governments and corporations jockeyed for position and waited for the great technological breakthroughs (and profits) sure to come.

And waited. And waited.

Gradually the Alvazoni faded from the news. At first it took a war to push them off the front page; by now it would take a war to put them back *on* the front page.

"Sir, I'm sure there must be a mistake. Something as important as the Alvazoni certainly needs the attention and care that only a seasoned and experienced case officer could—"

He smiled again and shook his head.

"Good try, Norman, but you're stuck. As long as your uncle is chairman of the appropriations committee, you're our man for the Alvazoni. Report to their consulate tomorrow, nine A.M. Ferguson, the old case officer, will brief you. Then I think I'll send him on a nice, long vacation to one of the foreign embassies. He deserves it for screwing up like this. Maybe I'll send him to some really godforsaken pesthole. Like New York City."

"Sir, really, I'll talk with my uncle. Perhaps I could take Ferguson's place in New York. I've been taking intensive language training in Brooklynese. I'm sure we can work this—"

"Nine A.M., Norman. Please don't be late. I understand the Alvazoni very much appreciate promptness."

"Two things you have to remember about the Alvazoni," Ferguson said. He was thin and short, nervous, and he paced as he talked, his hands never still.

"First of all, they're VERY polite. It's the glue that holds their civilization together. You can't put thirty billion beings on a planet the size of Mars and keep a civilization if you're NOT polite. So politeness is very important to them. Insult one and he's likely to commit suicide.

"And, secondly, they're broke. Flat busted."

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"Wait a minute," I said. "How the hell can they be broke? I've seen the grants the governments and corporations gave them to get them started, until we got the exchange system worked out. They should have plenty of money."

"It's their politeness," Ferguson explained. "Give you an example. They went to a museum with a delegation from France. One of the French stopped to admire a painting, an Old Master. So, out of politeness, the Alvazoni bought it for him. $20 million. You do that a few times and all that lovely money goes away fast."

"All right, I'll be polite and keep them out of museums. How's the rest of it going?"

"You mean how successful have I been in getting their technology out of them? Lousy. No success whatsoever. If we bring it up in a roundabout way, they change the subject. And if we ask directly . . . "

"What?"

"Two of them committed suicide. Wasn't polite to deny our request, but damned if they were going to give us the technology. No way out of the problem except one," Ferguson said. He shivered. "They were so damned apologetic about the suicides that we almost lost another one. So we don't ask directly anymore. I don't know how we're going to get anywhere."

Ferguson stopped and smiled.

"But that's not my problem anymore," he said.

I was desperate. My career wasn't much, but it was all I had. And, like many a desperate coward before me, I tried the most desperate tactic of all: the truth.

"Ferguson, I don't know how to tell you this. The latest cables from New York look bad. Foreigners are getting kidnapped all over the place. If you're from Connecticut you're in big trouble. The Bronx and Queens just declared war on Harlem and Bed-Stuy. Our latest intelligence is that the Shriners and the Rotary are being armed by New Jersey. They deny everything, of course. Damn Jerseys. I spent all last week drawing contingency plans for air strikes against Newark. Problem was finding a place in Newark where anyone could tell there had *been* an air strike after we were done . . . "

"Forget it, Norman. I'm not going to trade with you. The Alvazoni are your problem now."

"But Ferguson—"

He looked at his watch and picked his coat off the chair.

"Comb your hair. Straighten your tie. Get off your knees and on your feet."

I stood with as much dignity as I could and brushed off my knees.

"You have an appointment with Fezal, the Alvazoni ambassador, in ten minutes. Good luck."

I closed the door behind Ferguson, closed my eyes, and breathed deeply, three times. Then I opened my eyes and spent the next five minutes practicing my most ingratiating smile in the mirror.

It needed work.

Fezal was small and furry and smelled like a three-day-old pastrami sandwich. I followed Alvazoni protocol and embraced him as an old friend. Later, I promised myself, I'd burn the suit.

"To be graced by your presence, sir,

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is to make me feel as if I have reason to live," I gushed.

"Your words fill me with joy. I embrace you," he said, and hugged me again.

Beats the hell out of a handshake.

We sat and exchanged pleasantries. This took a half hour. Then I spent another half hour explaining that Ferguson was no longer the case officer. I then spent another hour consoling Fezal and convincing him that it wasn't his fault about Ferguson and that he didn't need to commit suicide.

When he cheered up I ordered lunch. I'd never eaten sauteed grubs before but, what the hell, they tasted better than the food in the department cafeteria. I tucked in and asked for seconds. Fezal beamed at me.

"How glorious to find a friend who does not have an allergy to our food, as did friend Ferguson," he said. I almost gagged, but managed to turn it into a smile. So that was how Ferguson managed to avoid this stuff. And he never warned me. May he be kidnapped by Grey Panthers and sentenced to one of their fertility rites, I thought.

"I am indeed your friend, my dear Fezal. And as a friend I must speak to you, one being to one being," I said.

He stopped eating, forelimb halfway to his mouth. If my indoctrination on Alvazoni body language was accurate, his expression was one of dread. And, in an incredible breach of Alvazoni etiquette, he interrupted me.

"I haven't mentioned my ancestors, have I? Such an oversight, I should be dead. Such fine ancestors who worked so very hard, so that myself could attain the meager position I now hold. Gladly would I go to meet those ancestors. Gladly would I submit myself to their judgment of my miserable life. Gladly would I leave this world, and my wife, and children, and siblings and all those who depend on me. Did I mention my wife needs an operation, my children need their fangs adjusted and my wife's sibling depends on me for sustenance, due to economic readjustments on the home world?"

In other words, Norman, please shut up. Don't ask me directly about anything, because then I'll have to commit suicide, you ass. And I bloody well can't afford it right now. Though after listening to his spiel about his wife, his kid's braces, and his brother-in-law living with him I wasn't sure I was doing him a favor by keeping him alive.

I shut up and finished my drink. I looked at it briefly, shuddered, and promised myself to NOT ask what it was.

"Ancestors are why we are what we are," I said solemnly, "yet the time to visit them is when one can stand with all of one's allotted time expended to good cause. To visit them earlier, while a joy to the individual, is a burden to the ancestors. Such selfishness would surely be impolite."

Fezal relaxed. I smiled and remembered the year I spent in advertising before I joined the Department. This was going to be a piece of cake.

"What I have for you, dear, dear friend Fezal, is a gift you and others will enjoy. A holovision set."

Why a holovision?

Why not?

"A distorted view of our glorious

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culture," one of the contact specialists said. His face screwed up in distaste. "Imagine the opinion the Alvazoni would form of us from our situation comedies and commercials. We'd never live it down as we move to full membership in the Galactic community."

Situation comedies, hell, I thought. What if they watched the news? God, they'd quarantine the whole bloody planet. (Yeah, I know it was our holovision broadcasts that led the Alvazoni to the planet. Once one of the Alvazoni explained to me that the signals didn't make any sense when decoded [another point to them for good taste] so they just assumed they were some kind of homing signal.)

Ferguson tried to sell them a lot of things, including the technology behind holovision, but nothing Ferguson tried worked. I needed new ideas. More specifically, I needed the Alvazoni to get new ideas, to find something we had that they wanted so we could trade for some of that lovely technology. Since I had no idea what that something would be, I wanted to expose them to as many products as possible, as quickly as possible.

Ever found better advertising than on holovision?

So I got them the set, ignored the contact specialists, and settled down to wait. And wait. And wait.

I was close to the end of my double solitaire game, when the delivery man knocked at the door. Fezal was gone for lunch, alone, after I politely declined because of the new ulcer I sported whenever he rhapsodized about sauteed grubs.

"Hey, can you sign for this?" the delivery man asked. He held out a clipboard with an invoice on it. He stood next to a dolly packed high with cardboard boxes.

"What is this?" I asked.

"Mac, I don't read 'em. I just deliver. And I got three more loads out in the truck. Now, if you want 'em, sign the paper and you can read it yourself. Else I got other deliveries to make. So what'll it be?" he asked.

I read the invoice quickly. Fezal had placed the order using a credit card I knew was overdrawn. The order was made out to Greatest Hits Records.

I signed.

Soon the office was filled with twenty cardboard boxes. And as a diplomat, a gentleman, a friend of Fezal's, and as a man who always carried a pocket knife, I opened one of the boxes.

Whit Slimman's Greatest Hits. The Imitations Sing The Real Things Greatest Hits. Pelvis Dead! His Greatest Hits From Beyond The Grave.

I scratched my head and wondered what the hell was going on. As far as I knew the Alvazoni didn't even own a recording player. Which would make it tough for them to enjoy even the Pelvis, no matter how dead he was.

Fezal found me at my desk, one of the recordings on my left, and an unofficial, extremely illegal, and frighteningly accurate credit report on my right. I gestured to the chair in front of me. Fezal hesitated for a moment, as if he was going to run, then sagged and collapsed in the chair.

"Friend Fezal, I am your friend. And as your friend, your problems are my problems. Therefore I am troubled, as I know you must be troubled. I signed for twenty BOXES of recordings today,

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recordings you ordered, on an account," I touched the credit report "that you most certainly cannot pay for.

"In many cultures," I said carefully, my fingers steepled in front of my face, "this would be considered a grave breach of courtesy."

Fezal groaned and closed his eyes. His hand moved toward his ceremonial dagger.

"Luckily," I said hastily, "in my culture this is not a problem."

He opened one eye and bent his head toward me. He looked skeptical, but his hand stopped on the dagger.

"Oh great friend Norman, I am listening to you. Listening but not understanding. Would you please say your words again, and explain them to me?"

In other words, Norman, are you crazy? I've spent more money than I've got, or I'm ever going to get, and you're telling me this is all right?

God, I love this country.

"Fezal, my people have a tremendous fascination with things. Things we want, things we must have, things, things, and more things. And like you, we cannot afford all these things. But we must have them.

"Credit is a powerful thing, Fezal. With credit you can buy all the things you want. And you never have to pay it back."

He stared at me as if I was crazy. I didn't mind, as long as his hand stayed away from that dagger.

"But, great and confusing friend Norman, people do expect to be paid for these things. The letters I have received lately, and the calls from a man named Guido, have made it very clear to me that people indeed expect payment," Fezal said.

Now you're mine, I thought.

"Of course they expect to be paid, friend Fezal. And pay them you will. With money you borrow."

"Borrowed money must be repaid," Fezal said. I laughed.

"My apologies, Fezal, but you couldn't be more wrong. If things worked that way, if everyone repaid their debts, our economic system would collapse overnight."

Fezal shook his head, another argument for the power of parallel social evolution. He gestured to the recordings.

"I don't understand," he said.

"On Earth, when you borrow money, you pay interest on that money to the person who loaned you the money. That person doesn't want the money back. Just interest on the money. If you return the money, you sadden them, because now they have to find someone else to take their money," I said.

"So it is polite to borrow money?" Fezal asked.

"As long as you pay the interest," I said.

"We have no money," Fezal said. He sounded doubtful. "Still, we must be polite."

"Indeed," I said smoothly. "I'm sure we can work something out. But, why did you buy this stuff?"

"I was watching your late night holovision and a man on the holovision asked me to buy these recordings. It would be impolite to refuse," Fezal said earnestly.

I smiled for a moment at the idea of a group of Alvazoni clustered around

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a player, listening to Whit Slimman. Or the Pelvis, and shuddered.

"Now, as to money. I fully understand and respect the need of the Alvazoni to retain their technology. I would never ask you to violate that sacred trust. Yet, perhaps, some small, unimportant item such as toys for our children might be of interest, strictly for novelty value of course, here on Earth . . . "

The toy rose smoothly from the tabletop and stopped about a meter in the air and hung there. The generals and admirals around the table stared at the small sphere as if it were going to bite.

"It's some kind of trick," one four-star said.

"No," I said. "It's anti-gravity. And it's a children's toy."

"Children?"

"Alvazoni children. This is something they might give a two-year-old. Like we'd give one a toy electric train," I said.

"So what good is a toy to us?" growled the Marine general.

"It's a toy, but it uses the same principles as their larger ships. Just like a toy electric train uses all the principles of an electric locomotive. Tear this apart, figure out how it works, and you figure out how everything else they have works," I said.

It wasn't that easy, of course, but we pried and poked and started to get new ideas. And Fezal kept selling me more and different toys.

Yes, I suppose I should have paid more attention to what he was doing with the money, but once the generals and admirals got going they were insatiable. And persistent.

Besides, I'm not a saint. A raging bull market caught what was left of my attention. The price/earnings multiple on the market just kept going up and up and up. Consumer-oriented companies of all kinds kept reporting record sales. I put some money in the market, then some more, then decided what the hell and put in everything I had.

And it went up. It doubled. It tripled. It quadrupled.

I remember that time as a golden age, now. The Alvazoni were happy, the generals were happy, I was happy. Hell, even my boss was happy. And to top it all off Ferguson managed to get himself taken hostage in New York City by one of the private armies. The Salvation Army, for God's sake.

Life was good.

It had to end, of course.

One bright spring morning I arrived at the Alvazoni embassy. I carried a new box of credit cards for Fezal, and a wish list of new toys the military wanted.

The embassy gates were locked tight.

No one answered when I buzzed.

All the shades were drawn on the windows. Unusual for noon. The Alvazoni were morning people.

I waited a few minutes then shouted through the gate. Nothing happened. Alarmed, I considered the proper channels and all the diplomatic niceties and said to hell with it.

A convenient tree provided me with a ladder. The top of the wall was usually protected by a force-field, but today the usual shimmer of super-heated air was gone. I cautiously stepped onto the wall, and then down onto the other side.

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I crouched, tense, and waited for alarms and dogs and guards and all the other nonsense you find around embassies.

And that's all I did. Waited.

The main door was locked. By this time I was half-way to panic. I ran around the building, trying each door as I passed it. All locked. Finally I pried open a window.

The embassy was empty.

I don't mean the Alvazoni were gone, I mean the embassy was empty. No furniture. No doors. Hell, not even any upper floors. It was all gone, just a shell left behind. A great big empty, if you understand me.

I rushed out of the building and down to headquarters. The secretary tried to stop me, but I forced my way into his office. I must have made absolutely no sense, because the next thing I remembered was my boss forcing a scotch into my hand.

"What do you mean they're gone?" he asked.

"Gone. All gone. Building empty. Everything. Gone," I said. I drained the scotch and poured myself another. My boss glared at me but I ignored him. Right then I didn't care how tough it was for him to smuggle scotch through the Fish 'n Chips Curtain.

Three hours later we had confirmation, not just from the local embassy, but from all the embassies around the world. The Alvazoni were gone. From everywhere.

"What the hell did you do?" he shouted.

"Nothing," I said. "I brought the usual box of credit cards, and everyone was gone. Nothing different. Nothing changed."

"Except that the Alvazoni are gone!"

"There is that small difference," I admitted. I looked longingly at the scotch bottle. He put it back in his desk drawer. And locked the drawer.

"Do you have any idea what this means?" he shouted.

"No."

He glared at me for a moment, then slammed his fist on top of his desk. I jumped and waited for the lightning to strike me.

"Neither do I," he admitted. "But it certainly means something. Right?"

"Right," I agreed.

Right then I should have shaved off all my hair, gotten some quick plastic surgery in Stockholm (no, not that kind of surgery) and donned a saffron robe. If I had, then I could be happily begging in some Godforsaken corner of Asia.

We all make mistakes.

The next day the stock market crashed.

How do you tell a crash from a correction? Easy. Just count the number of free-fall artists who take the air express elevator out of their office windows down to street level.

By noon I was broke. Worse, my boss was broke.

Worst, the Alvazoni came back.

Go way out into the country, away from all the city lights. Look up at the sky and gasp in wonder at all the millions and millions of stars. Now double that number and imagine every new star was an Alvazoni warship.

Fezal projected his image into the main War Room and asked for me. The assembled admirals and generals tried

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to bullshit him; that's why the state of California is now the California Trench and all that lovely desert in Nevada and Arizona is now beach front property.

I was dragged into the War Room and shoved to the front. I saw Fezal and promptly slid on my most unctuous smile.

"Friend Fezal, how good to see you. And to think I believed you returned to your homeland without the courtesy of a farewell feast," I said. In other words, you SOB, where did you go?

"Oh, friend Norman, to see you makes my heart sing and my being fill with joy. To greet you is to greet my heart's desire. Yet, is it not written that in every hello there lives a goodbye?"

"My heart is saddened at the prospect that never again will I, your most humble servant, be graced with the opportunity to learn from you. Even the crumbs of knowledge that fell from your table were full nourishment to such a worm as myself," I said.

"Yes. Crumbs," he said. I waited for the rest of the courtesies, then realized that was it. Such a grave breach of etiquette. If I was an Alvazoni I was sure I would have taken the hint and done the honorable thing. Well, first of all I wasn't an Alvazoni and, secondly, damned if I was going to commit suicide.

At least right away.

"Friend Norman, our sojourn on your planet has taught us a great deal about comparative economic systems. The holovision sets you provided us brought all of your products into our purview. As is our custom, out of politeness, we purchased them. And purchased them. And purchased them," he said.

"If you are worried about the expenses, please don't worry," I said desperately. I didn't even look at the brass behind me. "A special grant has been arranged for you, so no embarrassment is involved—"

"Unfortunately, the possessions we purchased," he continued smoothly, "have proven to include a less than beneficial side-effect on our society. Some among us have shown a reluctance to share with others. Some, indeed, have shown an unacceptable desire to accumulate more and more possessions. When directly admired, the object is not freely given. Instead it is offered for sale. This is not acceptable.

"So we have brought it all back to you, Norman."

"Fezal, you can't—"

"This will, of course, cancel all our debts since we have returned the goods purchased. We will then take our leave from your solar system. Perhaps we shall return in a century or two."

"Fezal, for God's sake," I begged.

"Goodbye, Norman," Fezal said. His image faded. "I certainly wish you the best of luck."

My name was co-signer on all of Fezal's credit cards. Technically, I now owed all the banks on Earth something on the order of one million tons of gold.

And guess what, I just didn't have that much in my checking account.

The ensuing riots were a thing of beauty, if you admire that sort of thing. Before the end of the day there was a howling mob in every major city on Earth, each demanding part of my anatomy. Unfortunately, I just didn't have that many parts to go around.

I still had a few of Fezal's toys

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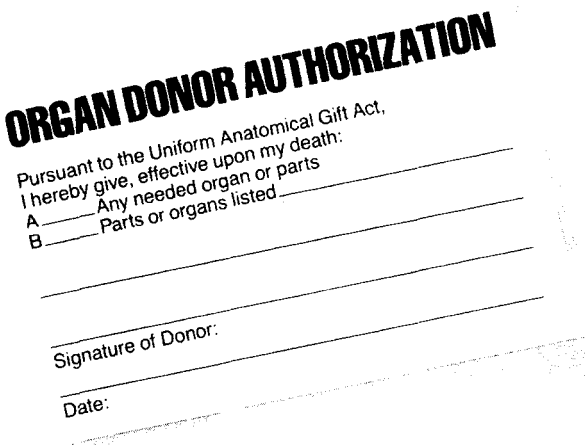
stashed away, as an insurance policy. I cashed the policy with some of the admirals and generals and they found me this nice hideaway.

That's the whole story. I really don't have much to do anymore. All the stuff Fezal bought is in orbit, locked up by the lawyers and courts of a hundred countries, but I guess it still belongs to me, officially.

Say, have I got a deal for you. You wouldn't happen to need a billion or so Bonco Combination Pocket Fishing Tackle Lures and Potato Peelers would you . . . ? ■

Before you do crack, do this.


ORGAN DONOR AUTHORIZATION
Pursuant to the Uniform Anatomical Gift Act,
I hereby give, effective upon my death:
A _____ Any needed organ or parts
B _____ Parts or organs listed
Signature of Donor:
Date:

Partnership for a Drug-Free America, N.Y., NY 10017

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on gaming

Matthew J. Costello

It's hard to believe that the Dungeons and Dragons phenomenon emerged as just a variant in a medieval miniatures game. Instead of massed skirmishes between heavily armed forces, Gary Gygax and Dave Arneson decided to send their unwary soldiers into a castle dungeon.

Of course, we all know what they found there. . . . living skeletons, ubiquitous orcs, and the now well-documented dragon. From such modest beginnings only a dozen years ago, game fortunes have been made, lost, and made again.

The computer game world was quick to capitalize on such dungeon fever, and I could outfit a well-stocked game room with nothing but computerized fantasy role-playing games. It was getting to the point that each new game that arrived aroused in me only tedium.

But last summer I witnessed something that attracted even my jaded interest. I was attending Gen-Con, one of the two big national game conventions. Some enterprising computer outlet had stocked a room with Mackintosh computers, all loaded with a game called *Dark Castle*. For a small fee, you could play the game, in a sort of round-robin, haphazard tournament with the winner receiving a prize of some kind.

But no matter. It was the game that drew the crowds. Dark Castle was a whimsical, clever game with vivid animation. It drew on the frantic action pioneered in the fully-animated, interactive disk game, *Dragon's Lair*. While still very much a computer game, *Dark Castle* was more active and imaginative than the rest of the pack.

I was sorely disappointed when I discovered that this nifty game was only available for the Mac.

But now Silicon Beach Software has licensed Three-Sixty Pacific Inc. (2105 South Bascom, Campbell, CA, 95008) and I'm happy to report, the game is available in a number of formats including versions for the Amiga and IBM and its host of clones.

The game remains the same. You must enter said castle and defeat a character aptly named the Black Knight. As soon as you cross the threshold to the castle, you must select a door to enter. Then, you face one of fourteen danger zones, all of them alive with man-biting bats and rats, whip-wielding thugs, and assorted creepy-crawlies. All you're armed with, by the way, is rocks. You just aim your arm and, like Sandy Koufax in his salad days, let go with a stone.

The chambers are intriguing, inviting places to watch your character die. So many games are simply annoying with their "puzzle" solutions to dungeon traps. *Dark Castle* has a sense of humor and, what's even more important, a sense of logic.

There are a few things that you should keep in mind. Whenever possible, take out the baddies before trying to get

(continued on page 121)

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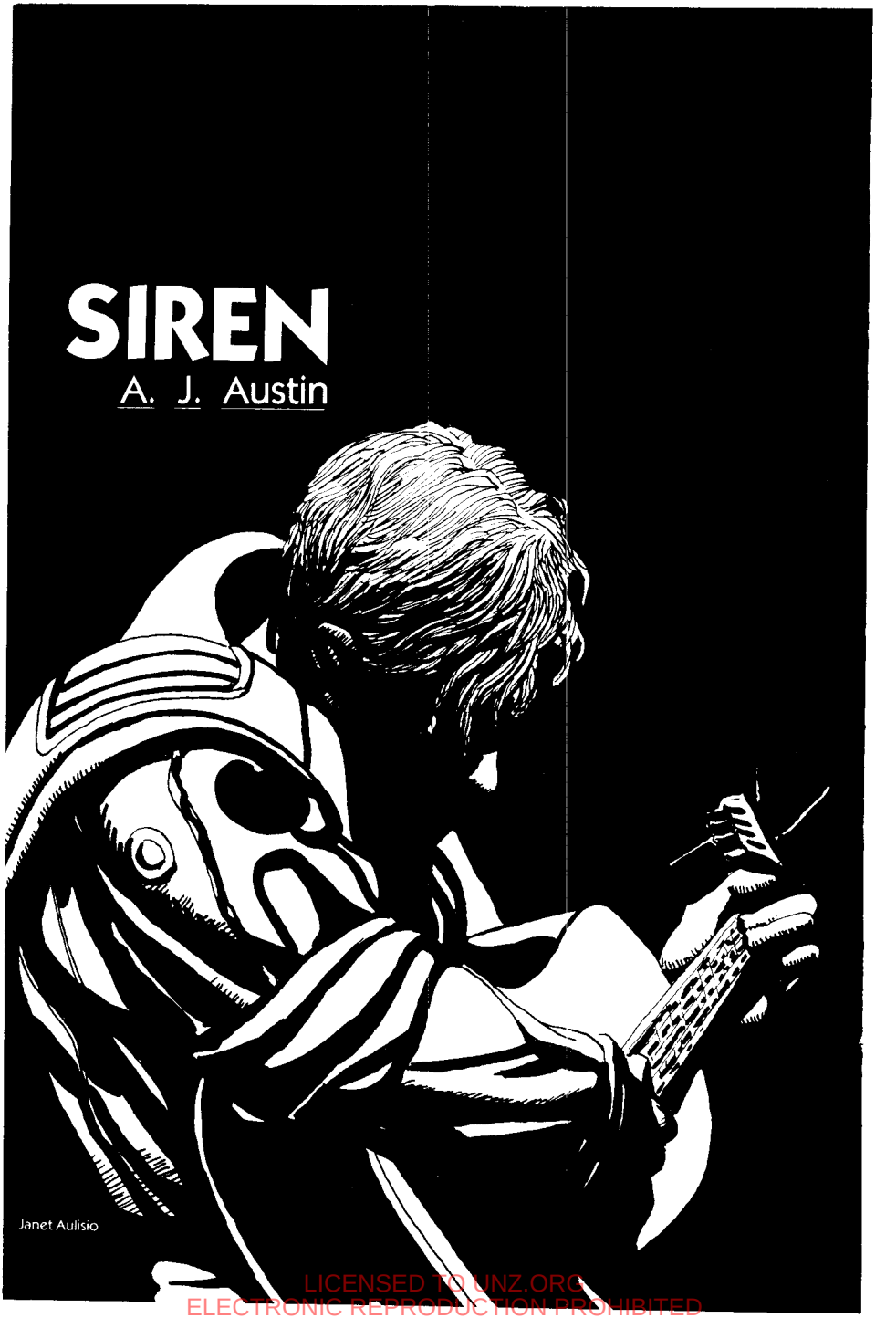
SIREN

A. J. Austin



Janet Aulisio

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Contacts with alien life-forms may be peculiar sorts of things—perhaps so peculiar that only those who've experienced these can understand them.

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"Hang in there guy, we're on our way." It was Doc. I'd recognize his voice anywhere. "Just sit quiet and relax for a while, don't move around too much. We'll see you in no time at all."

Liar. (And oh, such a good liar!) But that was all part of the Doc's job on these missions, wasn't it? In fact, it's probably one of the biggest requirements of the ship psychologist on any of these survey missions. I mean, let's face it; no one really needs to be analyzed out here. If we did, we'd never have made it on the trip in the first place. So what else was there for the psych to do? Simple. Bring him out of his cabin just to lie like hell to the guy in trouble. And make sure the poor sap believes you're telling him the truth. Don't want him going into hysterics and ruining any of that expensive equipment now, do we, for God's sake. The heck with us, save the hardware.

Got a man in trouble? Put the psych on the line: *Hold on, man! You'll be fine! We're almost there! You can handle it! Help is on the way! Stay calm!*

Got a survey member stranded on the surface? Ship psychologist to the rescue: *You'll be alright! We'll be there in two shakes! Hey, got a pot of hot coffee waiting here on the ship for you with your name on it! Don't want coffee, huh? Well how about Shirley, from up in navigation? Yeah, you know her . . . she was asking about you the other day, stud! I'll bet she'd have a surprise or two waitin' for you when we get you back up here, so just hang in there!*

Do these clowns get picked for these missions because they have the inborn talent for making this drivel up on their own, or do all ship psychs have to memorize a whole book of it before they qualify for outbound?

"Doctor?" I asked.

"Yes, Terry?" Have you ever noticed how they always use your first name when they know you're about to lose your butt? I mean, Ten-Star-Commander of an entire fleet with about a million guys under him will call you by your first name when he knows you're gonna buy it. After he's asked someone what it is, of course.

"Doctor, do you ever stop lying long enough to realize I'm smart enough to know what you're trying to pull on me? Fact: That damned rock took out half the equipment on the lander. Fact: The soonest you could get here is in about an hour, maybe forty-five minutes. Fact: The only air I've got left is from the emergency tank. Look, I know you think I'm just some dumb farm boy kid who doesn't belong out here, but I'm not stupid. I know what's coming."

"Terry, this is Captain Morraine. Doc's right, it's better if you don't talk. Just be still, we're on our way. Hang in there, Terry." First name, from The Captain. Oh, wonderful.

"Captain—may I call you Bob? —Bob, I'll be dead at least thirty minutes by the time you reach my orbit. The only thing you'll find alive on this lander will be the siren. They like thin air."

"Please, son, don't talk." Son. That was a nice touch. I had to hand it to ol' Doc, he'd coached the captain pretty good. Or maybe he just loaned him his drivel book. Maybe captains had their own books.

"Hey, Doc? You still on the line?"

"Right here, Terry."

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"What's your first name?"

"Uh, it's Daryll," he answered.

"Hey, Daryll," I said. "Daryll, you're a lying bastard. You do know that, don't you?"

Of course, he started to protest in that oh-so-kind way that all doctors have, but I didn't really feel like listening to it right now. I shut off the radio and removed the headset, throwing it at the lander console as hard as I could. It bounced off one of the screens and spun in the air till the cord got all wrapped up, then stopped and began spinning in the other direction.

"Hey, but you're a really great liar, ya know?" I said, watching the headset slowly unwind itself again as it floated. Nothing like getting in the last word when you've had a rotten day.

Swiveling around in the seat, I looked at the siren. It was a gentle looking animal, really; sort of like a yellow koala bear. A yellow koala bear with a couple of extra legs, and fangs. Working fangs, I might add. My leg still hurt where the little jerk had bit me before I could get him stunned and throw him in the cage.

We really didn't know that much about the sirens. While the planet was crawling (and flying and swimming and slithering) with thousands of different forms of animal life, the sirens were relatively rare. But unlike the other animals, which, as you might imagine, were localized depending on planetary conditions, the little bear-like creatures were scattered virtually everywhere on the planet's surface. From the highest mountain areas to the lowest valleys, they seemed able to adapt to the most incredible temperature and atmosphere extremes the planet could throw at them. It was because of this adaptability that bringing a couple of them back to the ship was such a high priority. Well, that, and another somewhat more important reason.

The rest of the crew had taken to calling the little animals sirens after the first lander team had been killed. It was their second day on the surface. Gallagher was looking around about a hundred meters ahead when he came upon a small family of them. He'd been hypnotized or something by them, and had just lay down on the ground and went to sleep. At least, that's how Planson found him when he caught up. We could hear them up in the ship over Planson's suit mike, and it *was* hypnotic in a way. Then he started mumbling something about how pretty their singing was and he, too, just got real quiet and fell to the ground. We kept listening for several minutes, trying to sort out the various sounds we were hearing—singing, scuffling, singing, fabric tearing, singing. We knew something was wrong, but the singing seemed to say that everything was alright. Then, one after the other, both mikes went dead.

There wasn't much left by the time the second team managed to get there. Just torn pieces of bloody suit fabric and hardware, and a couple of dead sirens. Eaten at leisure by a family of six-legged teddy bears.

"Just you and me," I said to the bear, floating over to the stasis cage. "In about another twelve minutes or so, all this will be yours. You'd like that, wouldn't you?" It turned its head slowly, almost druglike, in the narrow stasis field of the cage; like a dancer in one of those underwater ballets you see at

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the resorts in Florida. The oversized yellow eyes were blinking out of that innocent face. Could this teddy bear really be a killer? But then, I'd seen the pictures the second team had brought back, seen what was left of Planson and Gallagher.

I couldn't help thinking of a cartoon I'd seen in one of the old magazines my grandfather used to keep up in his attic. It showed a picture of Winnie the Pooh with this huge gut hanging out, and as he was wiping his mouth, he says "Christopher Robin, Christopher Shmobin—a bear has got to eat!"

Of course. "Pooh! May I call you Pooh?" (blink-blink) "Pooh it is, then," I said as I pushed off the base of the cage in the direction of the storage locker. I stopped myself against the door, unlatched it, and took out the small guitar case I always kept there when I got surface assignment.

"You know, Pooh, most people, if they knew they only had a few minutes left to live, would be thinking of their final destinies, with their 'lives-flashing-before-their-eyes.' They'd be thinking of their sins. Guilts. Confession? Forgive me, Father, et cetera, et cetera, et cetera. Not me, Pooh. I'm taking this all rather well, I think. Doc would be proud of me. Think I oughta call him back and let him know?" (blink-blink) "No, you're right. Let him think the kid's in hysterics over here, screaming up the last of the oxygen a few minutes sooner than if he'd been quiet.

"Hey, Pooh," I said, unsnapping the latches on the case. The fuzzy face turned in my direction, watched me as I took the guitar out and began checking the strings. "You seem to like music. Ever hear a guitar in zero *g*? It was Collier, I think, who first took a guitar up on Discovery. No, wait. No, it wasn't, either. It was Scott, on one of the Atlantis flights. She about crapped in her pants when she heard it. Something about the vibration of the strings and sounding board with no *g* to affect them, combined with cabin pressure and the way your inner ear gets all screwed up. The sound is somehow different. The vibration just seems to go on and on. Not longer notes, exactly, just different—*more*. If only Segovia could have lived to hear that sound. Listen."

I played for the animal. Just a few notes, tuning the instrument. Then one of my favorites; a beautiful, lilting piece from early in the last century. Softly, at first, then stronger as tired fingers got into the feel of the composition. Each note was clear and clean, reverberating in the confined space of the damaged lander. Each note was *more*.

The siren blinked, tilting its head slowly, first one way, then the other, trying to orient on the alien (to him) music coming from my guitar. The animal just stared for several minutes, listening to me play, then opened its mouth and tried in vain to sing. The stasis field prevented it. I finished, waited for the last note to fade slowly away; the bear was still trying to sing.

"Don't bother trying to put me to sleep, little buddy. I'm already getting light-headed in here." The siren wasn't bothered by the rapid decrease in the oxygen levels, of course, being used to the atmospheric extremes back down on the planet. I, on the other hand, was

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feeling the early stages of slow suffocation.

"Hey, Pooh," I said, picking out an up-tempo melody. "Listen to this: 'The bear went over the mountain, the bear went over the mountain, the bear went over the mountaiiiiiin, to see what he could see!!' " I was beginning to miss some of the notes, now; fingers slipping from the frets more and more frequently. I started gasping, more than singing.

" . . . and all that he could see . . . and all that he . . . could see, and all . . . and all that he could see . . . was . . . the other . . . other side . . ."

My head was spinning as I stopped, trying to catch my breath, just floating in the stale air. Floating, trying to clear my head, staring at the animal. It was staring at me, too, probably wondering why the music had stopped.

Leaving the guitar hanging there, I floated over to the cage, unfastened the door, shut off the stasis. "There. No sense now." Reaching behind me, I again took the guitar, held it in my hands. The siren had come out of the cage, was now perched on the door. It was holding onto the mesh with both pairs of its back paws, its front paws floating out in front of it, listening blink-blink as I softly, slowly strummed the instrument.

The siren sang. The eerie, beautiful voice matching in tempo my strumming, matching even the sound of the guitar itself.

When I stopped playing—could not play any longer—I released the guitar, allowing it to float freely across the cabin, spinning slowly end-over-end until it came to rest against the wall. The bear was still singing, continuing the simple melody that I had begun, building on it, filling the tiny cabin with its music. And as it sang, the song changed, began shifting to a different melody. Softer. More beautiful, more haunting, just more.

This must be your song, I thought. Gallagher, Planson; they hear this? This what put them to sleep? Killed them? I watched the bear, listened to the song as a feeling of warmth, of peace began flowing over me. My breathing slowed, the gasping for breath began to lessen. As I listened to that beautiful sound, I could see the rows of small, sharp teeth in the animal's mouth as it sang. The same mouth that tore Gallagher and Planson apart.

"*Not,*" sang the bear.

"Not? How not?" I asked. I don't know if I asked aloud. I don't even know if I "heard" his (yes, his) answer, or could feel it somehow in his singing.

"*We the dream. Only. Not the death. Not the kill. We dream for the dying.*"

My head was reeling now as I watched the bear, listening to The Song. It was so clear in my mind; each note, each sound ringing in the cabin. Looking at the cage, I watched the air around the animal begin to fill with sparkles as I listened to him sing, like a barrage of tracer bullets from an old black and white war film. The whole cabin was in black and white, now. Panel lights blinking black and white. Blink, black. Blink, white. The eyes, blink-blinking at me. The Song. The Dream.

The last thing I remember thinking was how beautiful it was, and how safe I felt.

* * *

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"You should be dead, you know," said the biotechnician as he had turned away from the bear; cut, laid open in dissection. "As it was, you were barely alive when we got to you. Your heart and respiration rate had slowed down to almost nothing. Do you always do that when you're in that kind of situation?"

"No," I said, looking down at what was left of the little animal. "I usually don't get into that kind of situation. What about the bear? There's not that much oxygen in the planet's atmosphere. It shouldn't have died. What killed it?"

"Don't know yet. Wish we had time to get a few live ones before we leave. Hard to make any kind of determination at this point with only dead animals to dissect. Don't let it worry you, though, it's not your fault it died. Leave the study of the local flora and fauna to the bios. Just get something to eat and head back to your cabin for a few days' rest. Take it easy till we get back to station."

Once through the door, I heard the snapping of his rubber gloves as they left the fingers of each of his hands. Looking back, there was just enough time before the bio unit door slid shut, to see him slide the bear into one of the freezer units.

I don't know just how long I sat in the commissary, ignoring the congratulations-you-made-it dinner they'd fixed for me. When they got to the lander and radioed back to the ship that I was still alive; the captain must have requisitioned the steak from his own private stores, but I really didn't care. The rest of the guys who had arranged the party had long since given up on me; the steak had long since gotten cold. I couldn't stop thinking about the little bear I'd just seen sliced up down in bio. It wasn't till I felt the slight shifting in the ship when we left orbit that I finally started back to my personal quarters.

Arriving at my cabin, I tore down the the crudely hand lettered "Welcome Home" banner that someone had stretched across the door, crumpled it, tossed it down the corridor, and watched for a few seconds as it bounced away and disappeared somewhere aft. When I looked around my cabin, I realized that I must have been out longer than I thought, because someone had managed to clean up the room, and return the personal gear I'd taken down to the surface. Whoever it was had even thought to return my guitar to its restraining strap over the bunk. I think that was the first time I'd felt even remotely happy since returning to the ship. I even felt good enough for the moment to ignore the blinking message light on the com panel for a while.

It felt good, closing my eyes and strumming the guitar. The sound always eases me when I'm upset, always helps me to relax. I didn't even mind that much when the com panel started beeping at me again.

"Terry, are you back yet?" It was Doc. No sense putting it off any longer; I knew I'd have to go through a session with the psych sooner or later. We always did when ever one of us came out of a danger situation. Might as well get it over with.

"Yeah, Doc, I'm back." My voice triggered the unit into two-way mode as I continued softly strumming the guitar. "What do you want?"

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"Nothing, just now. I just wanted to make sure you were OK. But I would like to get together with you sometime soon for a little chat. You've been through a lot in the last few days that I think we need to talk about, don't you?"

"Yeah, sure," I said. "If you say so. I've been doing a lot of thinking in the last hour or so, and I think I've come up with a few answers. At least I've figured out some answers to a few of the questions I've been asking myself lately."

"Oh, really? Care to tell me about them?" he asked. He seemed genuinely interested. But then doctors always seem interested in your problems, whether they are or not. It didn't really matter, I felt like talking anyway.

"Well, first off," I began, "why aren't I dead? I should have been, and you know it. You can't explain why I went into that coma, but apparently that's what saved me. And what about the bear, why did he die? He shouldn't have, there was still plenty of oxygen in the cabin air for him."

"So you think you've figured it out?" He sounded very patronizing.

"Yeah. *He* did it. He kept me alive. That's what that singing we heard was all about. *Something* got our guys down on the planet, but it wasn't them. The bears were just innocent bystanders. Something else had already gotten to Gallagher and Planson when they came along. They just made their dying easier, made their pain go away because they knew they were going to die. Just like the one on the lander knew I was going to die. And that's why it sang to me.

"But I didn't die, did I? The Song and The Dream kept me alive long enough for the ship to reach me, to pump in air."

"That's an interesting theory, Terry," said Doc. "Hey, who knows? I've seen a lot of strange things on these survey flights. Maybe you're right. Just consider yourself lucky that you made it as high as you did before the meteor hit the lander. If you'd been in a lower orbit, the siren may have had enough time to finish you off before we got to you." He'd missed the point entirely.

"But don't you see?" I shouted at the com panel. "They *aren't* killers! They don't put their victims to sleep before they kill them, like some kind of vampires. They aren't vicious animals at all. The one on the lander thought I was going to die, and tried to make my dying easier. Taking the pain of dying away from me is what killed it." My hands were shaking. I hadn't even noticed that I was gripping the neck of my guitar so tightly that my fingers were beginning to hurt. Forcing myself to calm down, I again started strumming.

"Well, maybe you're right," he said. "Anyway, we might have an answer by the time we get home. You probably haven't heard, but the guys who were on the last lander brought back a live siren before we broke orbit. They've got it down in bio now.

"In the meantime, why don't you try to get some sleep. We can get into this tomorrow when you're feeling a bit more rested. Alright, Terry?"

Assured that I would be a good boy, he broke the connection.

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It took almost an hour before I got the courage to call down to bio.

"Yes, what is it?" he answered, his voice keying the communications unit into two-way. As he did, I reached out and flipped my panel into the "lock" position. I was pleased to hear that it was the same tech I'd talked to a few hours ago. He was obviously not pleased about being interrupted in his work.

His work. The microphones on the com panels were excellent. They picked up everything in the room, and in the background, I could hear it. It was making noises, but the noises didn't sound right. The animal was restrained somehow. It couldn't be in stasis, or it wouldn't be able to make any noise at all. Maybe it was drugged. Or maybe they'd even gagged it.

"Hello? Who is this?" the tech wanted to know.

"It's Correll, we were talking about the bears when I was there earlier. Remember, you told me that you wished you had a live one to cut up." I tried to keep the conversation as light as I could. Tried like hell to keep the horror I was feeling out of my voice. "I just wanted to see if you'd found out anything yet."

"Oh, yeah, hi kid. No, I don't have anything yet; just getting started, really. All I've gotten so far is some blood, fur, and tissue samples. You should have heard him yell when I took the skin scrapings. I've got him tied down to the cutting table now. I'll be starting vivisection in a few minutes if you want to come down and watch." Vivisection was SOP when the landing teams brought something interesting back. I was hoping they'd keep this one alive, though, since it was the only one we had. I was wrong.

"I've got a better idea," I said. "How about if I come down and start cutting you open for a while?"

"Hey, what the hell's your problem, anyway?"

"In fact, why don't I just come down there right now? I'm sure you've got an extra knife or two."

"You gotta be nuts. Suppose I just get security to throw your crazy ass in the tank till the psych can iron your problems out," he said. And the whole time he's yelling at me, I can hear him trying to buzz security on the com panel, but he can't because I've got it locked at my end.

"If you want security, I guess you'll just have to run and get them. I'll wait. I'm in no hurry," I lied. I was in a big hurry.

I could hear a mixture of sounds over the com: something small and metallic hitting the deck plates, the tech going for the door as fast as he could, the usual eletronic beeps and clicks of the lab equipment, the bear. The bear. I realized what the sound was, even through the com. It was the sound of fear; cold, brutal fear. He was crying in fear; and in pain.

Once I'd switched the com panel back to unlock, it didn't take long before it seemed like half the ship was trying to reach me; the tech had been faster than I thought. Before I answered, I slipped a cassette in the player built into the top of my bunk, and listened as the soft guitar sounds filled the cabin.

"Terry, is everything OK?"

"Oh, hi doc. Yeah, everything's fine. Why, something wrong?" I was

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trying to sound calm, as if nothing had happened. I wanted him to think I really had no idea what he wanted. I wanted him to think I was schizoid, or flipping out, or anything; I really didn't care what he thought as long as I got him up here.

"Look, Terry. I'm going to come see you. Would that be alright with you? Would you wait there for me if I came to see you?" he asked softly.

"Sure."

"Alright, Terry. I'll be there in just a couple minutes. Do me a favor, and leave the com on, okay? Just leave the unit on."

"Alright, if you want me to," I answered. But by that time, I was already starting for the door, setting the lock from the inside before sliding it shut. I could just barely hear the tape playing from outside as I headed to bio with my guitar.

The tech had lied to me, I saw, the moment I entered the lab. The bear was strapped down to the examination table alright, but the tech had already started cutting on one of the animal's legs. He just lay there, moaning, unable to move because of the system of tubing-restraints-electrodes common to this type of examination. As his eyes turned toward me, I could see that he wasn't in too much actual physical pain caused by the procedure; whatever drugs they had given him before they started were seeing to that, I was certain. But I could feel in the small sounds he was making that his pain was caused by the sheer terror of going through a torture that he couldn't possibly understand.

I didn't know how much time I had. Sliding the door closed, I locked it from inside and slowly approached the bear. I slowly, carefully began to remove some of the paraphernalia attached to him. He started thrashing around as soon as I got his legs free, trying to bite me several times but couldn't because of whatever they'd injected him with. He did manage to break free before I had the last of the straps off, and jumped across the room. Some of the electrodes were still attached to the shaved places on his skin, and the thin wires dangled behind him as he sailed weightlessly to an overhead light.

"It's all right," I said quietly, hoping that the tone of my voice might convey my thoughts where the words wouldn't. He blinked down at me from that light, nearly panic stricken; the open leg bleeding badly now that it was away from the tubing and equipment of the examination table. He gripped the light tightly as he frantically looked around the room for someplace to run, to hide.

He was just hanging there, shaking, looking at me when he started to cry again. It was that horrible, sickening kind of whimper you hear from the porch when your dog has been hit by a car, and he's just managed to barely make it to your door where he knows you'll make everything alright again. The kind of whimper that cuts into you, because you know he hurts, you know he's terrified, and as he looks into your eyes he can't understand why you won't please, please, please make the hurting and the fear go away. But you can't do anything for him. You can't even touch him, because the sound of his cry makes you helpless, and you just want to run away and you don't know why.

And as I looked at him, I began to

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cry. I would not run away, couldn't. I played. From memory, I played The Song. The strains of the melody filling the room. The notes clear, clean—*more;* the guitar, The Song, sounding only as it can in zero *g*.

The little animal began to calm. The shaking became slower and slower as I continued to play. The whimpering stopped and his panting slowed. As he relaxed, he stopped looking around the room and turned slightly back in my direction, and he opened his mouth in the same way the bear on the lander had.

"Who?" he sang.

"A friend," I answered, again not knowing if I was speaking aloud or not. I fought the urge to stop when I heard the security team at the bio door, trying to bypass the lock circuitry from outside. I could see them through the glass, pounding on the door, yelling at me to let them in. I did my best to shut them out of my mind and continued to play. "Please, don't be afraid."

And as I played, a feeling of peace flowed over me; and, I think, the siren as well. I could sense that he was no longer afraid, no longer in pain.

And as the sounds of The Song filled the lab, I could feel The Dream begin to draw the two of us closer together, to connect us somehow. I could feel the bear as he fell into sleep, a sleep from which I knew he wouldn't awake. I felt the total peace that I knew he felt.

And as we shared The Dream as one, I felt him say how beautiful My Song was, and how safe he felt. I heard him thank me.

And I felt strong hands on my shoulders. I felt myself being shaken violently and being held against the wall by one of the security men, pinned there as someone else bound my hands behind me. When they turned me around, I saw the blood on the wall where my face had hit; I looked at my reflection in one of the wall cabinets and saw the blood begin to gather at the end of my nose in a glob that just stayed there. I hadn't even felt the force of impact against the wall, and was only now beginning to notice the throbbing aches from the several blows I must have taken from the security men. One of them had a fair amount of blood on his hands and face, but I didn't know if it was mine or his. I didn't care.

My vision started clearing, and I could see pieces of my guitar floating around the room. Several of the larger pieces had already come to rest in corners, leaving only the smaller ones still in the air—how long had it taken? I hurt in several places, and I wondered just what they'd had to do to wake me.

Doc was there. When security was satisfied I was under control, they let him come over to where they were holding me. He looked at me, and I could see genuine worry and concern in his face. He took a handkerchief or something and gently wiped some of the blood from my nose and face.

"Are you going to be all right?" he asked quietly. I tried to answer, felt my head swim.

"It's okay, Terry. Don't try to talk just now. I saw what happened. I heard. We all did. Let's get you to the infirmary. Sorry about the nose, but we had to snap you out of it somehow. I almost thought we'd lost you there for a mo-

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ment. Glad you made it." Then he smiled and reached out and softly put his hand on my shoulder. I could tell from the touch of his hand that he meant it. Maybe he wasn't such a bad guy after all. Maybe he'd really been a caring person all along, and I just didn't bother to see it. That thought made me feel better, just in itself.

An injured person in zero *g* is an easy thing to handle. With one person on each side, you become just another weightless bundle, easily carried. As they slowly floated me headfirst out of the room, I got a chance for one last look back. The room was a wreck. I must have put up quite a fight, although I don't remember it. The pieces of my guitar had all finally come to rest in various parts of the room. Maintenance was already there, starting to clean up the mess. The biotechnician was there, too, helping put the lab back into shape. I guess he didn't really hold any kind of a grudge against me, because he smiled at me as they took me to sick bay.

The last thing I saw before they carried me out of sight of the lab was that tech. He had retrieved something small and yellow from one of the corners of the room, and as the door slid shut I saw him put it very, very gently into a freezer unit. ■

ON GAMING

(continued from page 109)

through one of the danger zones. Otherwise you'll find yourself fending off a blood-sucking bat while trying to climb up a rope. Also, look for opportunities to improve your weapons. Look carefully and you can find a mace, fireballs, and a bottle of magic elixir that can ward off bites from the vermin.

Gauntlet was one of last year's most popular arcade games and it featured a "dungeon" theme. Its chief attractions were classy graphics and a multi-level dungeon that literally teamed with monsters. It was hack-and-slash gaming carried to the ultimate. The computer version just released by Mindscape (3444 Dundee Road, Northbrook, IL 60062) has much of the flavor of the hit game but, in its Commodore incarnation, it lacks the exciting detail that made the mindlessness of *Gauntlet* somehow more palatable.

Demon Stalkers is much better (Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404). The story is the same. . . . 99 levels of a dungeon populated with everything from man-eating snapper plants to ghosts that look like they leaped from the pages of a Casper comic. But the Dungeon of Doomfane, as it is named, also has helpful clues laying about, treasure, and a trivia quiz that rewards astute players with bonus health points.

There's also a Dungeon Construction Set, a save-game feature, and an appropriately legendary story that gets more interesting the deeper you delve. ■

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THE ANALYTICAL LABORATORY

Once more we'd like to thank everyone who voted in our annual poll on the previous year's issues (and gently chide those who didn't). The feedback your votes provide has always been very useful to us—and consequently to you. It's even more important now that we're giving cash awards to the first-place winner in each category, a practice we hope to be able to continue. If an author or artist does an especially good job of entertaining you, he'd certainly appreciate your thanks. This is the most meaningful way I know for you to convey them, and the more votes we get, the more meaningful it is.

To review the procedure, we have four categories: novellas and novelettes, short stories, fact articles, and covers. (Actually, this year we should have also included serials, since we had three, but we mistakenly said we didn't and our long lead time made it impossible to correct the error. Some readers caught it on their own and voted for serials anyway, but not enough to make the results meaningful. Our apologies for the confusion.) In each category, we asked you to list your three favorite items, in descending order of preference. Each first place vote counted as three points, second place two, and third place one. The total number of points for each item was divided by the maximum it *could* have received (if everyone had ranked it #1) and multiplied by 10. The result is the score listed below, on a scale of 0 (nobody

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voted for it) to 10 (everybody liked it best). In practice, scores run lower in categories with many entries than in those with only a few. For comparison, I've included in parentheses at the head of each category the score every item would have received had all been equally popular.

NOVELLAS AND NOVELETTES (0.77)

1. "The Gift," Pat Forde (2.48)
2. "The Forest of Time," Michael F. Flynn (2.20)
3. "Candle in a Cosmic Wind," Joseph Manzione (1.59)
4. (tie): "In the Kingdom at Morning," Stephen L. Burns (1.38)
   "Banshee," Timothy Zahn (1.38)
5. "Cobwebs," Ray Brown (1.30)

SHORT STORIES (0.50)

1. "The Love Song of Laura Morrison," Jerry Oltion (1.54)
2. "The Grand Tour," Charles Sheffield (1.46)
3. "Neither Rain nor Sleet nor Weirdness," Jerry Oltion (1.34)
4. "Mortality," Rick Cook (1.14)
5. "Independents," Eric Vinicoff (1.02)

FACT ARTICLES (1.54)

1. "Nanotechnology," Chris Peterson and K. Eric Drexler (3.07)
2. "Memetics and the Modular Mind," H. Keith Henson (2.90)
3. "Moonbase Orientation Manual," Ben Bova (2.81)
4. "Universe—the Ultimate Artifact?" Richard D. Meisner (1.82)
5. "Cheap but not Dirty: Proposal for a Spaceplane," Tom Pace and Dan DeLong (1.52)

COVERS (1.54)

1. January: Vincent di Fate, for *The Smoke Ring* (3.51)
2. November: Todd Hamilton, for "Nanny" (2.51)
3. February: Alan Gutierrez, for "In the Kingdom at Morning" (2.16)
4. April: David Hardy, for "A Hole in the Sun" (2.12)
5. July: Dell Harris, for "The Changeling Hunt" (1.86)

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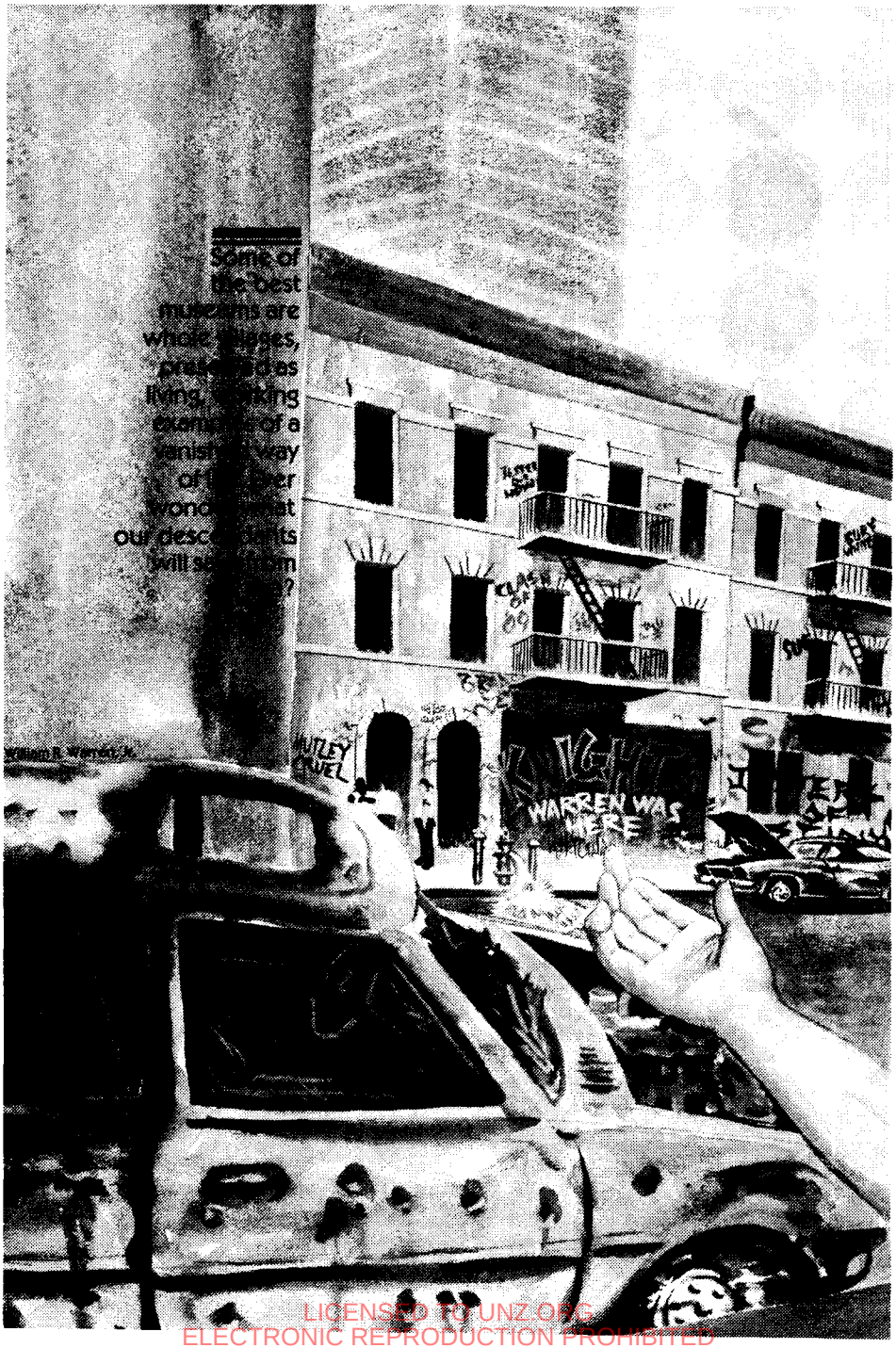
Some of the best museums are whole villages, preserved as living, breathing examples of a vanishing way of life. Never wondered what our descendants will say about us?
William R. Wendt, Jr.
HUTLEY CRUEL
WARREN WAS HERE

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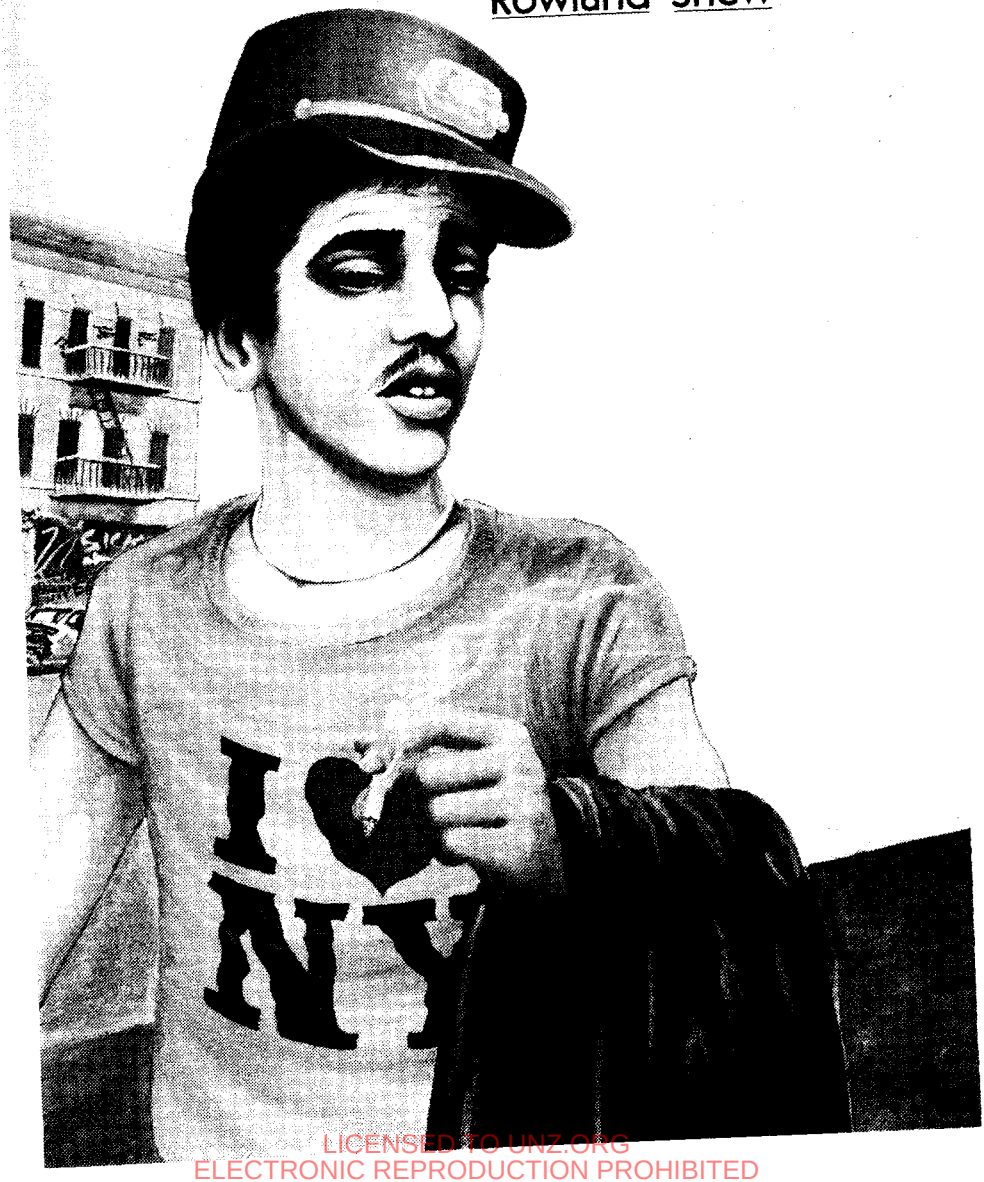
GRAVE RESERVATIONS

Rowland Shew



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Tony Fanculli cast a sour eye at the Reservation Police and resigned himself to a long wait for the tour bus coming from Jersey. The police were searching cars as they exited the tunnel, and the traffic was backed up all the way to Secaucus.

He hated drawing tour duty. It was worse than jury duty. At least jurors dealt with New Yorkers—often officials high in city government. Tour guides had to deal with hicks. He sighed and reviewed the tour package instructions for the hundredth time.

By the time the bus arrived at the tour dock, he knew what to expect. It was a mixed group from most of the Nine Nations: a couple of Dixiecans, a Breadbasket family, a Texan, some Sunbelters, three Westerners, and a pair of Ecotopians. He recognized the latter when they disembarked: they were clad in hiking boots and backpacks and were chewing something which Tony assumed was granola. He shuddered. If the Good Lord had meant for people to eat granola, He would never have given us The Hoagie.

He could tell from their white faces and shaky gait that the bus had taken them on the Jersey Turnpike Thrill Ride. The Ride was often included with the tour package since the OSHA people had ruled it sufficiently safe. New Jersey drivers were the best in the world. They had to be, to drive the way they did and live to tell of it.

The tour leader, Gayle Possit, approached him. He had dealt with Gayle many times before and found her to be tolerable, for a hick. She lived out in the country somewhere, in a place called New Haven. "Sorry we're late," she said. "What was the delay?"

Tony gestured toward the roadblock where the Reservation Police were still stopping cars. "Sales tax check," he said.

One of the hicks heard him and frowned. From his flashy and vulgar clothing, Tony judged him to be one of the Dixiecans. The man was actually wearing a *checkered* jacket. "What do y'all mean, sales tax check? You mean it ain't a search for an escaped convict or one of them there Mafiosi we read about?"

Before Tony could answer, a police whistle blew, and they all turned in time to see the police drag a driver out of her car. The trunk lid was sprung, revealing a color television set. One of the policemen read the sales slip.

"It's Joisey, awright," he announced.

His partner shook his head sadly and addressed the woman. "Yer ID sez you're a City resident. Don'cha know it's illegal to buy somethin' widdout payin' the sales tax?"

"But I did pay the sales tax!" she protested. "I bought it in Joisey and paid Joisey taxes."

"Don't matter where ya bought it. City people gotta pay City taxes. Ya owe the City the difference between what'cha paid Joisey and what'cha shoulda paid the City. That's been the law since the 1980s." He waved his baton. "Take her in, Charlie. Sales tax evasion." He turned his attention back to the cars still in line, many of whose drivers were now looking rather nervous.

Tony nodded in satisfaction. Another

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desperate criminal brought to justice. New York's Finest never slept. He turned back to the tour group, who were still watching the tunnel blockage goggle-eyed. "Welcome to da City," he announced.

"Hold on thar!" bellowed a man ridiculously garbed in string tie, cowboy hat, and tooled boots. "Is that true, what we jest heard? No matter whar a New Yorker shops, he pays New York taxes?"

Tony was nettled at having his Welcome Speech interrupted. "Certainly," he said curtly. "It ain't right to cheat the City. People only go shoppin' in Joisey to escape paying their Fair Share of taxes; so when we catch 'em, we make 'em pay the difference. That takes the incentive out of buying outside the City. The merchants are all for it."

One of the Ecotopians spoke up. "What if that lady had bought her TV in Portland? There's *no* sales tax in Portland."

Tony was so stunned at the thought that there was a place with no sales tax that he didn't even ask where Portland was. All he knew was it was somewhere in the vast wastelands west of the Hudson.

Gayle spoke up, soothing the group. "Now, remember we signed a paper before we left, pledging not to criticize native customs, no matter how bizarre they appear. After all, each of the Nine Nations has customs that seem strange to the other Eight. The New York Reservation is even stranger. In this case, New Yorkers believe that a person's money really belongs to the government, a belief once widely held in the old U.S.A., mostly in the northeast; but now restricted to the New York and Washington Reservations. It's a quaint belief; but the City only has sales tax agreements with the Foundry States of New Jersey and West Connecticut. New Yorkers are not sure even that other states exist."

Tony fumed while he listened. Gayle was OK, but somehow she always sounded patronizing when explaining City customs to the hicks. Personally, Tony did not feel any need to explain anything. After all, New York was The Greatest City in The World. One of the radio stations said so every morning. He cleared his throat and started his Welcome Speech over.

"Welcome to da City. Da Big Apple. Da Greatest City inna World." He always started the speech in his native tongue, because the hicks loved to hear it; but he always made an effort to conduct the tour in something approaching Standard English. "Me, I'm Tony Fanculli, yer guide for the next eight hours. We'll start the tour here at the Port Authority and head Downtown, go up the East Side, through Midtown, down the West Side, and have you back here before dark. That's if we're lucky." He laughed at his own joke. Actually, there was seldom a problem with schedule. Tour groups always had right of way, even over taxi cabs. The City needed the hard currency the hicks brought in—especially Western currency, which was gold-backed. Everyone recognized this, even the street gangs, who limited their tourist predation to the obligatory purse snatching. (Tourists were provided with special "break away" purses for just this purpose.) Tony checked his itinerary. The Lords of Death were sup-

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posed to snatch two purses from this group down in the Village.

Gayle interrupted. "One word of warning, if I may. If you become separated from the group, proceed immediately to the nearest public phone and call the Tourist Board. There are bound to be a few public phones in working order. Do *not*, repeat not, attempt to ask a native for directions. Only one in three will give you the correct directions, and, of course, you have no way of knowing which one. The natives have a quaint belief that if you don't already know how to get somewhere, you don't deserve to go there."

Tony double checked his itinerary. "Oh, there's one change to the tour. We will not be able to attend a meeting of the City Council. City Hall has been recently relocated to Riker's Island, which was the only place that all the officials could meet conveniently." He looked at the group. "So, regretfully, we must skip that part of the tour; although we still do plan to meet with Victor Steinmetz, who, before he retired, spent an entire career in City Government during the 1990s without once being indicted." He folded the papers and returned them to his jacket pocket. 'Now, are there any questions before we begin? I am an experienced tour guide, as Ms. Possit has undoubtedly told you. I've been just about everywhere there is to go."

"Oh? Have you ever been to St. Paul?" That was the Breadbasket mother. She was clad frumpishly in a shapeless print dress and had an obvious need, Tony thought, to visit Seventh Avenue.

'St. Paul?" he said. "Sure. It's up on 117th St. I told you, I been all over."

The Breadbasketer blinked in confusion, and a Sunbelter asked, "What about New Mexico? Ever been there?"

"Nah," Tony admitted. "I ain't never been outa the old U.S.A."

The Sunbelter looked offended, though Tony didn't know why.

"Well, then, where have you traveled?" asked a Westerner.

"I tol' ya, I been all over: SoHo, TriBeCa, the East Village, the Fashion District. I been all the way up to Washington Heights. I go to Brooklyn almost every week. I been to Staten Island a couple times; and once I even went to Joisey."

"Hell, son," drawled the Texan. "You call that travelin'? I go fu'ther than that just to reach the front gate of my ranch."

Gayle interposed herself and explained smoothly. "When a New Yorker says *everywhere*, he or she usually means 'everywhere in New York.' Actually, compared to many other natives, Mr. Fanculli really is well-traveled. Many people on the Reservation never even leave the neighborhood where they were born. They spend their whole lives in The Village, or on the Upper West Side, or wherever. They claim that, since all their needs are met within walking distance of their 'flat' or 'loft' or 'walk-up' that there's no reason to go anywhere else. So they think their own small corner of the world *is* the world. . . .

"Some of you may remember the so-called 'crack epidemic' of a while back. To hear the New York-centered media tell it, crack was everywhere. Yet, when the statistics were finally analyzed the police found it was largely confined to

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New York and its Miami and Los Angeles connections. Since the Media never went anywhere else, it naturally appeared to be 'everywhere.'''

They boarded the electric tram and wound their way down the specially cleared tourist lanes toward Wall Street. Tony kept pointing out sights and the hicks kept craning their necks and gawking. Occasionally he overheard comments:

"Have you noticed how *filthy* the streets are," a Westerner commented. "Not clean like Denver or Salt Lake City."

"Narrow, too," replied his companion. "Our *driveway* is wider than most of these lanes. And why do they drive such big cars when the streets are so narrow?"

"I don't understand what's so interesting about Chinatown," one of the Ecotopians said to the other. "They should come to San Francisco if they want to see a Chinatown."

"Daddy," said the Breadbasket child. "Why does the Man keep talking about The City. Does he mean Kansas City?"

"No, honey. He means New York City."

"Then why does he only say The City?"

Gayle, the tour coordinator explained. "All primitive peoples think of themselves as special. Often, their name for themselves means simply The People. The Navajo call themselves Na Dene; the Eskimo call themselves The Inuit. The implicit meaning is that other tribes are not really People. Well, in just the same way, New Yorkers talk about The City as if it were the only real city and other cities, like Dallas or Chicago or San Francisco, don't really matter. Whenever you hear a New Yorker say *'The'* you know he's talking about New York. Like The Met, The Guggenheim, The Street, and so on. You see, they are very parochial here and know next to nothing about life anywhere outside the Reservation."

When they passed the World Trade Center an Ecotopian noticed the name of the hotel nearby. He looked puzzled. "Vista International?" He looked up toward the top of the building. "Why do they call it the Vista *International?*"

"Because," Tony told them. "From the top, you can see Joisey."

The purse snatching in the Village came off as planned. The Death Lords were right on schedule, grabbing the purses and disappearing down Bleecker Street. It was professionally done and Tony made a mental note to raise the gang's tip. The hicks were all buzzing about law and order.

"Oh, my!" said the lady from St. Paul. "Is that what it's like to be a crime victim? That's never happened to me before."

"I wish they hadn't made me check mah shootin irons at the tunnel," complained the Texan. "I'd show them punks a thang or two."

'I'm afraid you can't bring guns into the City, sir," explained Tony patiently. "We have gun control here."

"Why's that?"

"Why? To cut down on Crime, of course!"

"Oh?" asked a Westerner. "Is that why New York is so safe at night?"

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"The City ain't all that dangerous," Tony protested. "You just gotta know where you can go, and when."

The Breadbasket lady was knitting. She looked up at him. "Tell me, young man. You've lived here your whole life, have you not? Perhaps thirty years? Well, how many times have you been a crime victim yourself?"

Tony pursed his lips and shook his head. "Not often." He counted on his fingers. "I've been mugged once, burglarized twice, and had my car stolen once."

"Well, that's not much in thirty years."

"Oh no, that's *this* year."

The Ecotopian boy raised his hand. "I read in the paper how a businessman and his Mafia partner set up a dummy corporation with a black politician as a front man to take advantage of the minority contractor law. Why did the jury let them go free?"

Tony frowned. "Why not? That law is just a technicality. Besides, it's hard to convince a New Yorker that an action is criminal if it doesn't actually involve someone sticking a gun in your face."

"And yet, since they walked away with your tax money, shouldn't you consider yourself a victim of *that* crime, as well? Why do you only count street crimes, committed by poor people?"

In the Wall Street area they marveled at the fleets of stretch limousines and other luxury cars parked up on the sidewalks of the narrow lanes. Somehow it seemed appropriate that the largest cars of all were saved for the narrowest streets of all. Maiden Lane looked like a Mercedes Benz show room. Pedestrians streamed around the cars, oblivious to the obstructions in their paths. The hicks noticed that many of the limos were occupied by men and women speaking animatedly on their car phones.

"What are they doing?" a Sunbelter asked.

"Doin' business. They're calling The Exchange or their brokers. Sometimes it's too crowded on The Floor. They can't get in the building, so they sit in their cars and work by phone."

"Why can't they just stay home and work by phone?" The Sunbelter was genuinely puzzled. "Don't you people have a DataNet yet? You can, like, plug in and download data, interface with anybody else on the Net."

Tony looked on him with pity. "But if they stayed home in Darien or Short Hills, *they wouldn't be doing business in The City!*"

There seemed no way to answer that. The Sunbelter fell silent, but Tony caught him later making whirly motions with his finger around his head.

They were just passing one of the Wall Street banks when a man flew abruptly through the main door and landed on the street in front of them. Two other men stood dusting their hands off in front of the bank building. "And don't come back till ya loin ta dress!" one of them said.

The object of their scorn stood up and brushed himself off. He saw the tourists looking at him and hung his head in shame.

"What's wrong with the way he's dressed?" asked the Texan.

Privately, Tony thought that a man wearing a string tie and cowboy boots

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would never understand the answer. Nevertheless, he tried to explain.

"Just look at his suit," he told the group. "A *brown* suit. How can anyone take seriously a man wearin' a brown suit? And woist of all . . ." He let the words drag out. "He's not wearin' a *power tie!*"

If he had expected a gasp of outrage, Tony was disappointed. All he saw were blank stares. "You see," he continued lamely, "a businessman in Manhattan must wear a black, blue, or pinstripe suit with a white or pale solid shirt and a power tie."

"Why?" asked a Sunbelter girl decked out in bright colored shorts, sunglasses and tan. (Tony wondered if her garb passed for business dress in San Diego or Albuquerque.) "Like, what has a person's clothing got to do with, y'know, his skills as a businessman or the values of his ideas?"

Once again, Gayle came to Tony's rescue. "Another feature of primitive tribes," she explained, "is the presence of sumptuary laws—often unwritten—regulating the sort of clothing tribal members are allowed to wear. For example, at one time in Europe only kings were allowed to wear purple clothing. The same is true of business garb in New York. Appearances count for more than substance. There is no logical reason for it. You or I might not refuse to deal with a person because he was wearing a brown suit, *or even if he was not wearing a suit at all*, but New Yorkers retain many old and quaint customs. For example, have you noticed the business women in their fashionable suit dresses, but wearing Adidas or Nike walking shoes? They change into their heels after they get to their offices."

"Hell, little lady," said the Texan, "that's the first thing I've seen today that makes *sense!*"

"Because it's difficult to walk across the grates in heels?"

"No, to outrun the muggers."

The businessman slunk away, hiding his face and the tram proceeded to South Street Seaport, which one of the Dixiecans likened to Baltimore Harbor —except it didn't have the water taxis like Baltimore had. Tony was scandalized that anyone would compare The City to a hick town like Baltimore, but he held his tongue rather than risk offending the Tourist Dollar.

Since the group would leave the tram for a while and walk around the shops, Tony decided it was time for the Safety Lecture. He gathered them in a half circle around him by the curb.

"Remember to be careful when crossin' the street. Wait for the light and look both ways, then run like hell to the other side. That won't guarantee success, but you'll have a better chance that way. If any cars honk at you—and many will—be sure to bang on their hoods with your fist. The drivers will expect it. The odds are only one in fifty that the driver will shoot you."

"In California," a Sunbelter said, "pedestrians have the right of way. Like, if a pedestrian, y'know, puts a toe into a crosswalk, cars have to stop."

Tony smiled. "It's not that way here." To demonstrate, he put his toe out into the street and immediately two passing automobiles and a gypsy cab swerved to run over it. Tony yanked it back safely in time. 'Do not try to ma-

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neuver on your own," he admonished the group. "Remember, I am a trained professional."

The hicks walked around the Seaport for a half hour and Tony was stunned when they returned without having bought anything. When he asked, all he got was shrugs. "There are book stores and clothing stores and such back home," was the answer they gave him. "We can buy the same things there for less."

The whole idea of the Tour Program was to suck in the hick dollars; but he had been noticing the reaction more and more lately: Why come to The City to buy things you can buy anywhere else? Tony bit his lip, thinking about the letter he would get from the Merchants' Association. With some misgivings he rounded them up and the tram set off for the trip up the East Side.

They had gone about a block when a car suddenly drove up on the sidewalk, cut in front of them and stopped. The driver hopped out and ran into a store. Since the street was only one lane wide and there were cars on both sides, the tram was unable to move. Tony waited patiently, but some of the hicks were angry.

"What did he do that for?" complained a Dixiecan. "Why, that's just flat out rude. Why did that fellow have to block the street like that when there's a parking garage just down the block?"

Tony gave him a blank look, not understanding the word "rude." "In The City," he told them, "no one can tell whether the streets are blocked or not. There's no difference in the flow of traffic. The guy wanted to run into the store. Why should he park half a block away when he can double park right in front? Anyhow, parking garages cost money. Besides, there aren't that many residents like him."

"What do you mean?" asked an Ecotopian.

"Residents who drive in the City. Very few actually drive cars. There are many who don't even have licenses."

"That's right," recalled the Texan. "My company hired a New Yorker one time. The poor feller was totally lost. The first time he tried to drive a car, he got in and grabbed the strap and waited for the door to close. Couldn't help feelin' sorry for him, the feller was so naive."

"Naive?! New Yorkers have Street Smarts!" Tony protested.

"Only for your streets, though. He just couldn't adjust to life off the Reservation; so pretty soon, he gave it up and scurried back where he come from."

Tony shook his head angrily. "That's impossible. This is The City. If You Can Make It Here, You Can Make It Anywhere!"

"Is that so?" The Texan looked amused. "Can you run an oil rig?"

"Or bring in a wheat crop?" asked the Breadbasket father.

"Or sail the Straits of Juan de Fuca?" That was the Ecotopian.

"Or run a herd of white-faces on the open range?"

"Or design a new LSIC chip?"

"Or tag 'gators down in the 'Glades?"

"Or survive a night on the Alaskan tundra?"

"Or pour steel in the Foundry?"

Gayle saw how the talk was headed and interrupted. "Excuse me, Tony; but if not that many New Yorkers drive, where did all those cars come from?"

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She waved at the unbroken lines of parked automobiles. They sat along both sides of the street, next to the fire hydrants and under the No Parking signs.

Tony shot her a look of gratitude for the planted question. "Oh, those, I said New Yorkers didn't *drive* cars; I never said they didn't *own* them. Many of these cars have been parked there for decades. See there? That's a 1955 Chevy Bel Air. Its owner, Morris Katz, who lived in the upper forties, found a parking space down here in October of '57. So he parked it here and took the train home. Neither his son nor his grandson have moved it since then, because they don't want to risk losing the space."

"Shoot. They couldn't move it nohow, son," the Texan drawled. "She ain't got no tires." (Actually, he said 'tars' but Tony caught his meaning. In the City, a parked car—or even one that was moving slowly—usually wound up being stripped.)

The Breadbasket child pointed to the cars. "Are those parking tickets in the windshields, Mister?"

"They sure enough are," interjected a Westerner. "How cum some cars have 'em and some don't?"

"Because the cops only write the tickets if the car's from out-of-town."

"But there aren't any No Parking signs!"

Tony shrugged. "So what? We don't need signs. Everyone knows you're not supposed to park there."

"Even the out-of-towners?"

"Oh, *they* don't. We do. Unmarked No Parking zones are one of The City's main sources of revenue."

* * *

The Ecotopian woman wrinkled her nose. "What's that smell?"

Tony smiled. He could usually expect to get a lead-in from one of the hicks at about this point in the tour. "That smell," he announced, "is one of the most historic sites in the entire City. As the tram turns here to follow the East River, if you would all look to your right, you will see *The Flying Trashman*. The legendary garbage scow that sailed the seas back in '87, fated never to reach port. They say that seven states and five foreign countries refused to berth her because the garbage was from New York and they believed, in their prejudice, that that meant it was dangerously toxic."

"Then why didn't you-all unload it when it finally returned here," asked a Dixiecan.

Tony stared at him in pity. "Are you nuts? It's probably dangerously toxic. Besides, Brooklyn and Islip couldn't agree on which particular articles of trash belonged to each municipality."

"Wait a minute, son. You mean grown men and women stood there like a passle of young'uns and said, 'I won't pick it up because I didn't put it there!'?"

Tony shook his head. "I didn't say anything about grown men and women. These were City politicians."

"What you may not realize," Gayle added, "is that New York is the last major city on the East Coast that still dumps untreated sewage directly into the sea."

Tony shrugged. "Sure, but the currents take it away from land."

The Ecotopians began to chant, "Save the Whales! Save the Whales!" But

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Gayle calmed them by pointing out that the currents that carried the sewage away from New York carried it to the Jersey Shore, where it washed up regularly on the northern beaches and in front of the Governor's summer house. The whales were in no danger; and nobody but Jerseyans cared about toxic waste in Jersey.

"Wait a consarn minute!" interrupted a Westerner. "You mean New York can do whatever it damn well pleases and New Jersey can't do a thing about it?"

"Yes. In fact, once the entire country had to change because New York wouldn't. Years ago, each state used to set its own drinking age. New York's was set at 18, while New Jersey and Connecticut were at 21. Thousands of teenagers would drive into the City every week to get drunk and then drive back, killing themselves and others. The other states tried for years to get New York to do something about the 'Blood Border.' But, the people who were complaining were not New York voters, while those who sold the liquor were. Finally, the old Federal Government stepped in and mandated that *all* states had to raise the drinking age to 21, even if they did not border New York. Many of the Western states protested that they had no trouble at all with Blood Borders, and that they had a sensible, two-tier drinking system, with 3.2 beer for the 18 year olds; but a *federal* law was a way out for the New York politicians."

They passed a group of tall buildings along the East River. 'Oh, look!" said the foreigner from New Mexico. "Ain't that the U.N.? Does the tour go there?"

Gayle answered his question. "No, sir, I'm afraid we don't go there. The admission fee that you paid at the tunnel coming in only covers admittance to the Reservation. The U.N. is covered by an additional fee. A sort of Reservation within the Reservation. And besides," she smiled quietly, "if you have a hard time dealing with New York customs, you'll *never* believe what goes on in there!"

They cruised past enormous office towers that had once been the headquarters of major corporations. Now, they were virtually empty, their windows smashed and their walls ablaze with graffiti. Tony told them about the Battle of the Tunnels, in which the mayor, real estate speculators, and other paragons of civic virtue had thrown up barricades to prevent the last of the corporations from leaving. It hadn't worked, however, since they forgot to blockade the Staten Island Ferry and the Corporations sneaked out the back way.

"But," he said brightly, "We still got the Mets an' the Yankees an' the Jets. Every year the Mets an' the Yankees play the Subway Series for the World Championship of City Baseball."

"What about the Giants?"

"The Giants?" he asked with a sneer. "The *Joisey* Giants? They were one of the first to leave, the traitors. Nah, Joisey got 'em. An' it soives 'em both right! Back in 1987, when someone said to Mayor Koch that The City should hold a tickertape parade for the Giants in case they won the Super Bowl, he

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said no, an' his aide said that 'some rube mayor in Moonachie' should throw a parade instead."

"Which they did," added Gayle.

"I remember that," said one of the Westerners. "Denver held a tickertape parade down 18th Street for the Broncos, who lost the Game, and more people showed up for that than showed up for the Giants."

Tony looked at him, bug-eyed. "They congratulated the *losers?*" Didn't these people know *anything* about sports?

The Breadbasket mother tugged at Tony's sleeve. "Young man. If all the corporations left back in the '90s, then what is that they're building over there?"

They all looked where she pointed. A framework of girders and brick was climbing to the sky. Hordes of workers ate their lunch or sat on large pieces of equipment or walked the girders, carrying things from one place to another so that other workers could carry them back.

"That," said Tony proudly, "is the new Koch-Trump Memorial Office Tower, named after the two men who, more than anyone else, made New York what it is today."

Men with clipboards ambled among the workers. The men with the clipboards outnumbered all the others. They were City inspectors, checking the plumbing, the wiring, the construction, the finances. They were signing licenses, stamping approvals, receiving kickbacks. There were inspectors from the buildings department, the roads department, the parks department, the Parking Authority, the Environmental Protection Agency, and the Mafia.

The Mafia inspectors were there to make sure that only substandard materials were used on the job and also that the graft was fairly distributed. Tony and the others watched while the pouring of a concrete caisson was interrupted so that the remains of Eduardo "Fat Eddie" Scutari could be added to the mix. Tony explained that the Mafia had run out of room in its retirement home under the East River. City legends had it that Jimmy Hoffa himself was resting in the foundations of one or more of these buildings and had not ended his days, as many others supposed, as an impurity in a steel ingot.

Just then, a workman tripped over a piece of pipe. He picked it up to throw it in the scrap bin. Immediately, all work on the site came to a halt. The first man froze, looked at the pipe in his hand, and dropped it as if it had become red hot. But it was too late. A wildcat strike had begun.

Thirty-five shop stewards, each representing one craft union converged on the gang boss' trailer, shouting and waving copies of their contracts.

"What's going on thar?" asked the Texan.

"Jurisdictional grievance," Tony answered. "That man there, he picked up a pipe."

"Well? The pipe was a hazard, wasn't it?"

"But the man wasn't a pipe fitter!"

Again, all he got from the hicks were blank stares. Didn't they realize how important craft boundaries were? If people were allowed to do work outside their craft, the result would be chaos. Before you knew it, one man would be doing the job of three and the cost of

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construction work would plummet. "It's a union rule," he explained lamely.

"Unions?" asked a Sunbelter. "You still have, like, unions here?"

"I bet they still have managements, too," sneered an Ecotopian.

"Well, if you have the one, you generally have the other," the Sunbelter told him. "They go together, like herpes and cold sores."

They broke for lunch at a "deli" and had bagels with cream cheese, New York's contribution to *haute cuisine*. Everyone agreed that the food was one of the high points of the tour. The Breadbasket mother turned and signalled. "Oh, waiter!" None of the young men and women scurrying about the dining area paid the slightest attention. Instead, they chatted with one another or read *Variety*.

Tony smiled and shook his head. "You hafta know how to call a City waiter." He turned and cupped his hands around his mouth. "CASTING CALL!"

Immediately, seventeen waiters and waitresses surrounded their table, 8 × 10 glossy publicity stills in their hands.

"You see," Tony explained to the group, "there are no waiters or waitresses in New York, only unemployed actors and actresses."

"Currently between engagements," one of the young ladies corrected him.

"Are they *really* actors and actresses?" asked Mama Breadbasket.

"Well, yes and no. Most of them have probably appeared off-off-Broadway and some off-Broadway; but I doubt more than one or two have actually appeared on Broadway."

"I've never understood that," said a Dixiecan. "Why the distinction between what street a theater is on?"

"It's not that," said Tony. "Some of the Broadway theaters aren't actually on Broadway. It's a distinction of class, or prestige. You Haven't Made It 'Till You've Made Broadway. This is The Heart of The Theater."

"Oh? I thought most of the new plays these days were coming from London, and New York was just a stop for the road companies." That was the Ecotopian girl. Tony scowled at her.

"What would someone from Ecotopia know about The Theater?"

"Why, don't you know? Even back in the 1980s, Seattle was premiering more new plays than any city in the old U.S.A. except New York. Care to guess who's Number One now?"

"A play that premieres in Seattle doesn't count."

"Why not?"

"Because the New York Drama Critics haven't reviewed it!"

She shrugged. "Who cares what they have to say?"

Tony's jaw dropped and he looked around. "Be careful! Someone might hear you!"

As they left the building, Tony noticed the headlines on the *News*. Nearly unique among newspapers, the back page of the *News* was a second "front page" featuring sports headlines. "Hey! How about that! The New York Giants won the game today!"

The Texan raised an eyebrow. "I thought they were the Jersey Giants."

"Only when they lose," explained Tony. "When they win, they're the

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New York Giants. It's a fine point of City grammar first popularized by Hizzoner Mayor Koch back in the 1980s."

As they cut through Central Park, Tony saw that they were in for a treat. The bird was singing and the flower was blooming.

They paused in the Fashion District and watched workers manhandle racks of clothing between buildings and into the backs of trucks. The trucks were parked on the sidewalks and in the middle of the street.

"Aren't those rather primitive production methods for the 21st Century?" asked a Sunbelter.

A Westerner answered her. "Why, this whole town is still stuck in the 19th or early 20th centuries. Didn't you notice back in that buildin' where we ate lunch? They still have human elevator operators."

"And their banks close at 3:00," said an Ecotopian. "I saw a sign in a bank window."

"There's a sound economic reason for that," protested Tony. "You see, if the banks are closed, people can't deposit their paychecks, so they cash them out at work. That means every Friday a large amount of cash is walking around the streets, which gives the muggers a fair chance to make a profit. . . ."

"Cash?" asked a Westerner, goggle-eyed. "Don't you have ACH or debit cards?"

"My word! What is that?"

Tony welcomed the interruption from Mama Breadbasket. They all turned to look where she was pointing. An incredibly thin and bony woman was walking down the street. Her skin had all the color of those fish species that lived their whole lives in dark caves. She was dressed bizarrely, in clothing that constricted her movements and which did not hang well unless she struck the most unnatural poses. Parts of her dress were of clear plastic, and not always the parts that one might suspect.

'That," said Tony proudly, "is This Year's Look." He saw the blank faces again and elaborated. 'This is the Fashion that all the women will be wearing this year."

The Texan scratched his chin. "I doubt that, son. Most women have better sense than that. What makes you think so?"

"Because New York is Where Fashions Are Made."

"You are very mistaken, young man," said the Breadbasket mother. "Nothing becomes a fashion until it is adopted in the Breadbasket. Until then, it is only a fad."

As they made their way down the West Side, a sound began to make itself felt. The Sound had always been there, in the background. A muted humming. Faint and indistinct. Now it grew louder and clearer: the sound of a hundred automobile horns blasting all at once. Tony passed hearing protection around.

"What you are hearing," he said through the throat mike, "is the world's first and only Permanent Traffic Jam. It was created in 1991 when Betsy Amato of Ozone Park tried to run a yellow light southbound on Ninth Avenue and got caught in the intersection. This Blocked the Box for the westbound traffic on Forty-fifth Street, which then backed up into the intersection on Eighth Avenue, stopping the northbound traffic

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there. The blockage ran back across Forty-fourth Street, plugging up southbound Ninth. At that point, none of the four streets could move."

The electric tram rolled down the sidewalk. A few cars in the traffic jam had tried to get around it by driving down the sidewalk themselves before getting stuck, but there was plenty of room for the narrow tour cars.

The drivers in the cars waved to the passing tourists, who waved back and clicked holographs to show the folks back home. One driver began to beat out a syncopated rhythm on his horn and others took it up with him. Soon the whole street was jamming to a monotonic tune.

"There was some thought given to crushing the cars *in situ* and paving over the whole mess; but everyone sorta hoped the jam would break up some day. Many of the drivers you see today are the children and grandchildren of the original drivers. They report to their cars at 9:00 every morning, honk their horns at the car blocking them, and leave at 5:00 each night."

"Do they get breaks?"

"Of course! They got a union. After a while a mathematician at Columbia showed that topologically the knot was permanent and the jam could not be untied in four dimensions. By then, however, it had become a permanent attraction."

"Why do they honk?" the Sunbelter girl asked. "I mean, like, it's obvious that honking at the car in front of you isn't going to do any good at all."

"Because it always seemed to work in the past," said Gayle, once again explaining the native customs. "Whenever a New Yorker was in a jam, he would honk his horn. If he honked long enough, the jam would break up. It was an easy step from there to the belief that honking the horn *caused* the jam to break. It's called *post hoc, ergo propter hoc,* or beating on the tom-toms. Many primitive tribes have similar beliefs. For example, if you beat on the tom-toms during an eclipse of the sun, it will restore the sun. Try it. You just had to remember to keep beating long enough."

When they reached the Port Authority Terminal, Tony gathered the hicks together for good-byes. He asked them what they thought about The City.

They told him.

New York just didn't measure up. Seattle was much nicer. Or Denver was. Or Albuquerque. Or Minneapolis-St. Paul. New York was too crowded, too dirty, too crooked, too dangerous. Its people were too rude. What did New York have that San Francisco or New Orleans or dozens of other big cities didn't have? Finally, Tony could take it no more.

"Hicks!" he exploded. "None of those places of yours have half of what New York has!"

"Well, we don't have half the crime."

"Or half the garbage."

"Or half the crooked politicians."

"Or half the traffic."

"Yeah, sure. And you don't have half the theaters; or half the museums; or . . . Just where do you come off actin' so superior?" He pointed at a Dixiecan. "Are you sayin' Atlanta don't have urban decay?" To a Sunbelter: "Or Los Angeles have traffic jams? What's the difference between Broadway hype and Hollywood plastic?" To the Texan: "Does Houston have any more urban planning than The City? Ain't there no

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crime in Dallas?" To a Westerner: "No pollution in Denver?" There were tears in his eyes now. "Why you gotta pick on New York, The Greatest City Inna World? What makes The City so special?"

They stared at him, half-astonished, half-embarrassed. Finally, Gayle cleared her throat. "Because New York *is* special. It's a vanishing way of life. We had to take steps to preserve it, *so that people would remember how bad things could get*. New York is our object lesson. Of course, all those other cities have the same problems, but the memory of New York helps us keep them from getting out of hand." She paused and patted Tony on the cheek. "Sometimes, though, it's easy to forget that New York is someone's hometown, too; and that people can love their hometown in the teeth of all logic and reason. You're a dear, Tony, and you've worked your heart out for the Tourist Board. I've noticed how tired and overwrought you've been the last couple of tours. You need a vacation."

Tony brightened. "Coney Island?"

"No, farther than that."

"The Hamptons?"

"No. I'd like you to join a tour group I'm putting together. We're going to visit the Southern California Reservation."

Tony glanced at the discomfited Sunbelters and his smile broadened. Now *that* sounded like fun! ■

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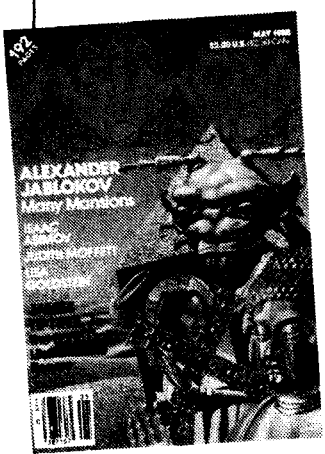

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The Alternate View

DINOSAUR BREATH

John G. Cramer

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The largest flying creature alive today is the Andean condor *Vultur gryphus*. At maximum size it weighs about 22 pounds and has a wingspread of about 10 feet. But 65 million years ago in the late cretaceous period, the last age of dinosaurs, there was another, larger flying animal, the giant pterosaur *Quetzalcotalus*. It had a wingspread of over 40 feet, the size of a small airplane. Other pterosaurs were also quite large. The pteranodons of the late jurassic period, the classic flying dinosaurs of magazine illustrations, had a maximum wingspan of about 33 feet.

This presents a puzzle: how is it that the largest flying animals of the cretaceous were able to attain so much greater size than modern birds? There are severe physical limits associated with flight. It is difficult for large birds to generate enough lift to take off. Consider the well-known square-cube law: if you double the size of a bird by simple scaling, its wing area and associated lift go up by 2^2, or a factor of 4, while the body weight that must be lifted goes up by a factor of 2^3, or a factor of 8. When an evolving flying animal species increases in size the basic design must be altered to accommodate the reduced lift-to-payload ratio. But if anything, the pterosaurs were less well designed than modern birds. They lacked the birds' efficient keelbone muscle structure and the aerodynamic advantages of feathers. How, then, could pterosaurs have grown so large?

A missing piece of this puzzle may have been discovered. There are indications that the cretaceous atmosphere may have been much richer in oxygen. Today, Earth's atmosphere contains about 77% nitrogen, 21% oxygen, 1% water vapor, 0.9% argon, and 0.03% carbon dioxide, with traces of about a dozen other gases. It's been commonly assumed that Earth-air stabilized at about this composition a few million years after life evolved on our planet, when the early plants photosynthesized most of the primordial carbon dioxide into free oxygen, and the early bacteria converted most of the primordial ammonia to free nitrogen and water.

But now there is evidence that the cretaceous atmosphere may have been very different. Samples of 80 million-year-old air have been analyzed. You well might ask how there could be samples of air trapped and preserved for 80 million years. Nature has provided the sample bottle.

Great forests of the extinct pine species *Pinus succinifer* once covered large areas of the world. Like modern pine trees the *Pinus succinifer* when injured by storms or boring insects had a tendency to drip pitch. This sticky resin would fall to the ground, accumulate, and eventually be buried. Over a multi-million year time span solidified pitch is fossilized into the hard resin *amber*.

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Illustration © 1988 by William R. Warren, Jr.

Amber in jewelry-grade specimens is almost clear, with a characteristic pale yellow color. Sometimes one finds ancient insects encased in amber. These were originally trapped in the sticky pitch and fossilized along with it, and they now provide an important base of knowledge about the insect life of past geologic eras.

As lumps of pine pitch fall to the ground and aggregate, pockets of air are sometimes enclosed, becoming tiny bubbles of air trapped in amber. The amber thus forms a natural "sample bottle," trapping air samples from millions of years in the past and preserving it for present analysis. Moreover, the sample bottles are labeled with a date of collection. Geological analysis of the rock strata in which the amber samples are found and evidence provided by organisms trapped in the amber along with the bubbles can be used to establish the age of the sample. In many cases the pressure inside such bubbles has become as high as 10 atmospheres from compression by the geological forces that converted the pitch to amber.

The bubbles are typically small, some only 0.01 millimeters in diameter. The quantity of air in such amber bubbles is minute. Even when a sizable sample of amber is crushed to release the trapped gases, the volume of air obtained is very small. Normal chemical analysis techniques would be utterly useless for such almost infinitesimal air volumes. But there is a better way.

A modern analytical instrument, the quadrupole mass spectrometer (QMS), is capable of analyzing very small gas samples into their constituent chemical elements. The gas sample is ionized, and an electrical discharge removes an electron from the gas atoms. These charged atoms are accelerated by a high voltage and passed between four charged bars. These bars run parallel through the instrument to form a "quadrupole" electric field. Adjacent bars have opposite voltages and are driven with a rapidly oscillating electric field. For ions of just the right mass, the varying electric field focuses and collects the atoms and delivers them very efficiently to the collection electrode at the end of

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the apparatus. For atoms of the wrong mass the field values are inappropriate, and they collide with the bar electrodes and are lost. The sensitivity and mass discrimination of this instrument are very good. It is relatively easy for the QMS to determine chemical abundances and even isotope ratios in a very small gas sample. That is what was done.

At a meeting of the Geological Society of America held last Fall in Phoenix, Robert Brenner of Yale University and Gary Landis of the U. S. Geological Survey reported the results of a QMS analysis of ancient air bubbles trapped in amber. They obtained a remarkable result. The atomsphere of the Earth, 80 million years ago, was discovered to have 50% more oxygen than modern air. Brenner and Landis found that for all gas samples taken from amber 80 million years old, the oxygen content ranged between 25% to 35% and averaged about 30% oxygen. Cretaceous air was supercharged with oxygen.

On the other hand, 40 million-year-old samples similarly analyzed showed about the same oxygen content as modern air, and 25 million-year-old samples showed slightly less oxygen than modern air. The composition of air has been shifting with time over a far broader range than geologists had thought possible. The cause of these excursions is not understood. Perhaps they are caused by a shift in the delicate balance between oxygen production by photosynthesis and oxygen trapping by exposed iron, sulfur, and organic reducing materials.

There is, of course, concern about whether these bubble samples accurately reflect the true atmospheric content. Is it possible that they have changed with time, leading to a false result? Atmospheric gases might have diffused in or out through the amber at different diffusion rates, changing the net composition of the trapped gas. Internal evidence of the samples themselves, however, argues against this. Most of the processes that are of concern, for example oxidation of the amber, would tend to *reduce* the oxygen content of the bubbles. Moreover, traces of hydrogen, a gas that diffuses far more readily than oxygen, are found in the bubbles with approximately modern concentrations. Analysis of bubble samples taken from modern tree resins also agrees with present atmospheric composition. The case for high oxygen in the cretaceous atmosphere seems, in a manner of speaking, air tight.

This result has very interesting implications about the era of the dinosaurs. The dinosaurs apparently breathed air that was much richer in oxygen than our air and lived in forests and grasslands that were far more combustible than ours. The metabolisms evolved to live in such an atmosphere might be radically different from ours. This new information may be relevant to many puzzles of the cretaceous and jurassic periods.

The problem of how the giant pterosaurs were able to generate enough energy to become airborne has troubled many paleontologists. For example, the Encyclopedia Britannica makes the unlikely suggestion that the pteranodon may have launched itself by "running downhill" on its stubby legs. The discovery of the oxygen enriched atmosphere of the cretaceous period sheds

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new light on this problem. In such an atmosphere many of the constraints of metabolism are relaxed. The creatures of the cretaceous may have been literally turbo-charged like race cars by the oxygen enriched atmosphere. It becomes plausible that a flying creature that evolved during that period could reach size limits that are impossible in today's anemic atmosphere.

Another puzzle from the era of the dinosaurs is the carbon layer at the cretaceous-tertiary boundary. The Alvarez hypothesis attributes the end of the cretaceous period to the collision of the Earth with a large chondritic meteor. The disintegrating meteor dumped vast quantities of fine iridium-rich dust into the atmosphere, bringing on a sort of "nuclear winter" that was connected with the extinction of the dinosaurs. A curious feature of this event, the "cretaceous catastrophe," is that a world-wide layer of finely divided carbon has been found at the cretaceous-tertiary boundary stratum beside the iridium rich dust from the Alvarez meteor. If this carbon is soot from a fire then the quantity of soot involved is truly enormous. Its quantity would require the simultaneous burning of a large fraction of the plant life on the Earth's surface, a sort of world-wide fire storm.

What produced this carbon layer and how? Was a fire ignited by the cretaceous meteor strike, or did the fire come later? How could such a world wide conflagration have occurred? Was it the meteor dust and its effects on climate and vegetation or the fire that killed the dinosaurs? The new information of oxygen content may provide important clues to these questions. The atmospheric oxygen data described above imply that the drop in atmospheric oxygen corresponded at least roughly to the cretaceous catastrophe. One can imagine a scenario in which the Alvarez meteor dust blocks sunlight for several years, causing a large fraction of the surface plant life to wither and die. The brown dead vegetable matter would then provide excellent fuel in the oxygen rich atmosphere. Spontaneous combustion or lightning might trigger a fire that would spread over the brown landscape, producing the worldwide fire storm. A fire of this magnitude might well consume enough oxygen to account for the observed composition drop. In any case, the combination of dust, decimated vegetation, colder climate, a world-wide fire, and a ⅓ drop in atmospheric oxygen could certainly have combined to bring about the extinction of the dinosaurs.

From the viewpoint of the follower of science fiction there are important lessons here. Time travelers must be aware that the cretaceous period is not the same as the 20th century. Oxygen is present in incendiary quantities. Use cigarettes and matches only with great caution. Do not wear flammable clothing during your cretaceous travels. Do not leave camp fires unattended. Smokey the Tyrannosaur says, "Only you can prevent forest fires!" ■

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Probability Zero

TOGETHER

Joe Fischetti

It had finally happened.

SETI International's mountaintop dish and signal-entropy analyzer system had finally come to life with the beep heard round the world. It had received a massive, ordered signal that *couldn't* have been generated randomly.

SETI released the information simultaneously worldwide.

Nations went frantic. Large nations, of course, responded to this success of the "search for extraterrestrial intelligence" by acting as if the responsibility for decoding and responding to the signal were uniquely theirs. The small nations asserted themselves individually, each proclaiming that Earth's reply had *better* include mention of its national brand of porridge, or local historical hero, or national fish. The "third world" suddenly became the third, fourth, fifth, sixth . . . hundred fifty-second . . . worlds.

Scientists and mathematicians worked round the clock, many a computer receiving a dent in the side the size of a man's fist for failing to make sense of the odd array of oscillations.

The break finally came when a nine-year-old watchmaker's daughter in the Swiss Alps, using a miniature wrist terminal her dad had made her, announced

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that the message wasn't in binary. She'd decoded part of it. She admonished the world scientific community with: "How naive! To believe that a civilization which can communicate across light-years would speak in baby talk!"

With this break the cryptanalysts, chessproblemmaniacs, and other information theorists were able to make swift progress.

"One of our planetary probes," a joint commission of spokespeople for the decoders announced when the work was nearing completion, "accidentally got aimed exactly in the aliens' direction, and the aliens thought the probe's transmission was an . . . application . . . by us, for . . . well, we're not sure. But their message to us amounts to a whole lot of questions about our society: our history to date, what we like to do, what we hope to accomplish, and so on."

Reams of answers were generated, the small nations insisting that since computer encoding could handle any amount of data that human authors could produce, *everything* should be sent. The argument was irrefutable; everything was.

Then the anxious wait of some dozen years.

The world agreed in principle that since the aliens now had a picture of our society, it would be nasty to change it on them before they could visit or reply.

But negotiations were difficult.

All nations finally agreed to a general hiatus on all wars except wars of expansion or overthrow.

The answer came back, and it was no easy task to decode it, since at first it seemed to be three repetitions of the same information (for assumed reasons of redundancy) . . . but on closer examination many differences were found. Clear at least—because the aliens had used our format in this matter—was that each of the sections ended with a set of three-dimensional galactic coordinates.

"They have bases in three separate stellar systems, that far separated?" the decoders exclaimed. "Preposterous!"

But several weeks later a follow-up message came, and its decoding offered no difficulties at all.

The president of the United States in the Oval Office, the members of the Politburo assembled at the Kremlin, the Emperor of Myisle, floating on his throne just off the coast of the one-acre island he ruled over . . . many others . . . each sat looking thoughtfully at the translation before him. . . .

"We trust that you have received the profiles and addresses of the three prospective partners we have provided. We guarantee that each is of like character to your society. We hope that you will have many enjoyable encounters." ■

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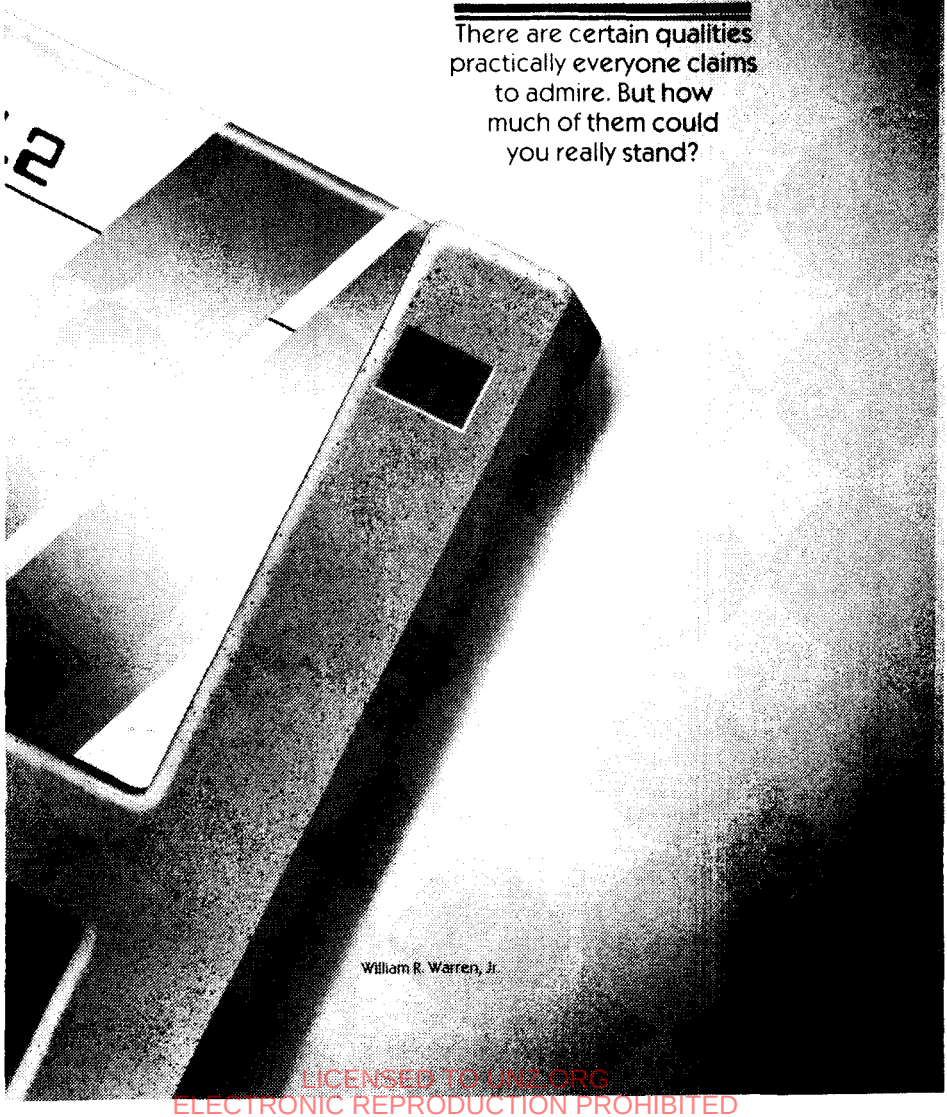
AND NOTHING BUT THE TRUTH

Joseph H. Delaney

There are certain qualities practically everyone claims to admire. But how much of them could you really stand?



William R. Warren, Jr.

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Inspector Dewey Quennel was a senior cop, so he seldom got involved in anything as mundane as burglary anymore. This morning, however, he did, for a couple of reasons. First, he was in the neighborhood when the call came over the air, and second because the victim was Universal Translators.

Universal was news these days, and had been for the last couple of months, and news like they created was not only good for their business it was good for Austin and it was good for Texas. But this occurrence was publicity of the wrong kind, a black mark on all three, and Quennel figured he'd best take charge of the scene and try to control the inevitable cloud of TV crews, until the regulars arrived to do the investigation.

That was why he was now seated in the foyer of Universal's plain red brick building, on one of those uncomfortable stone benches with the tie-on pad that never stayed put, talking to the distraught secretary who had discovered the mess.

He scrooched up for the nth time, bracing his feet flat against the polished terazzo floor, in an effort to keep his rump from sliding and remain semi-erect while he tried to write down a few notes. He hadn't started out with the intention of participating in the actual investigation, but the burglary detail had been delayed on another case across town and the only witness was about to start climbing the wall. He dunked the point of his pencil in his mouth for an instant, as though to draw inspiration from the act and then asked, "would you mind repeating your name, and spelling it?"

"Chi—C-H-I."

"First name, and middle initial, please. Uh—and where do you live?"

"Ginger—P., and I live at 10026 Gerard."

A patrolman stuck his head in the door and interrupted. "Sir, they're here—you said to let you know."

Quennel was on his feet instantly, and preparing to duck out the door. What stopped him was the sight of the white van with "Eyewitness News" painted across the sides in big red letters.

"Uh, I meant *them*, inspector, not the burglary squad. My partner just talked to the dispatcher—they're still tied up."

"Keep them out of the building, uh—" he glanced at the man's name-tag"—Burmudez. Uh, did you reach Mr. Barnhall?"

"Yes, Sir, he's on his way. I can let him in, I guess?"

"Right. Now, button this place up."

"Yes, Sir."

"All right, Miss Chi. Tell me what you saw when you got in this morning."

"C-couldn't I just show you, Inspector. It'd be easier."

"We don't want to disturb anything, Ma'am," Dewey replied.

"We-we won't have to—we couldn't, wait'll you see." She was already standing. She turned and took a couple of experimental steps.

Quennel rose to follow her. *Might as well humor her,* he thought, *and kill some time.*

Miss Chi led the way to a rear office, a big one, lushly appointed, without any name on the door. "They broke in here," she continued, "they must have backed a car up and hitched it to the

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window air-conditioner unit, and pulled it out by the roots."

The room was hot, because naturally the burglar hadn't bothered to plug the hole when he left. He'd obviously lingered long enough to make a real mess, from the looks of things.

Quennel stood in the doorway and gawked around the room, noting that the thief had apparently known what he was doing. Quennel could see the telltale wires of a professionally installed alarm system. None appeared to have been cut or even damaged, which suggested to him that somebody with a professional education had worked it over.

There was a massive walnut desk in the center of the room. All its drawers had been jerked out and dumped on the floor. Papers, office supplies, books, personal photographs, all the things a man keeps in his desk were strewn around on the brown and white shag carpet.

Quennel sucked in his breath, to emphasize his agreement with Miss Chi. "You are so right—this would have been a bear to describe. Any idea what the thief might have been after?"

"Not really," she replied. "We're not a cash business, or even a business with a lot of customer contact. There is a safe—in the office next door, but as far as I know there never has been any money in it. It was used strictly for protecting documents, and—and—" her eyes grew big, "new programs! Maybe we'd better check it."

Without waiting for Quennel to respond she brushed past him in a whiff of subtly fragrant perfume that left him with his senses swimming, and charged through the next door down the corridor.

He followed and, gentleman that he was, helped her up. "Are you hurt," he asked sympathetically.

"N-no, I don't think so. How clumsy of me." She struggled out of his grasp. He had held on rather too long to suit her, in view of their short acquaintance.

The reason for Ginger's downfall was a coat-tree, whose base hung out just at the edge of the door, with two of its feet pointing skyward. Next to it, on the floor was a heavily ribbed cardigan sweater with an immense black footprint and an even larger black smudge across it. On the nearby baby blue carpet were several more footprints and another great blotch, this time with the source apparent—ink from the overturned copy machine.

Here too, the desk had been ransacked, in a similar way, with a similar effect, but also with one important difference. One of the drawers, obviously cast carelessly down by the rampaging burglar, had something taped to the bottom. "What might that be, Miss Chi?"

"I—well, it looks like a floppy, inside an envelope." She stooped and started to grab for it, thus affording Inspector Quennel another opportunity to try a grab of his own.

"Uh! No, no, Miss Chi; mustn't touch until the fingerprint man gives the word." He held his breath, as well as the latest lungful of whatever maddening scent she was wearing, until nature forced him to capitulate.

He waltzed her over into the corner, where the safe door hung open behind a not very convincing copy of a pair of Gauguin nymphs. The safe was empty,

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and there was nothing on the floor nearby which suggested what was inside it was still in the room.

"Huhumm!"

Quennel turned with a start, to find a man standing behind him in the doorway. He was short and dark and from his jacket pocket there hung the badge of an Austin P.D. Sergeant.

"Sgt. Gomez, Inspector, burglary squad. Thanks for holding the fort."

"Uh, my pleasure, Sergeant," Quennel replied. And it was. He was holding not only the fort but Ginger—he now thought on a first name basis—Chi's tiny hand.

"I've got Mr. Barnhall waiting outside, Sir."

Miss Chi jerked her hand loose and took two quick steps to the right, turning as she did so.

So! Dewey thought, somewhat dismayed by his deduction, *there's more than an employer-employee relationship here*. He hoped the sergeant wasn't a gossip.

"Uh, the contents of the safe are missing, Gomez. That much I've established. That seems to have been the objective of the entry, although we won't know that for sure until somebody takes an inventory. Where's the forensic squad?"

"In the next office, Inspector. But considering what you just told me they ought to work this room first. I'll call them." He started for the door, but before he could leave the doorway was filled by an enormous black man whose name tag said "McCullom." He had something in his hand that looked like a bugspray outfit.

"It's gonna stink in here, folks," he announced, as he pulled a respirator up over his nose and mouth.

"Come on, Miss Chi." Quennel grabbed Ginger's hand. "He's right. He's going to fume the place for prints. The process uses the same solvent those quick glues do. It won't take very long."

They left, followed by Gomez, followed about a minute later by the tech.

"Pee-yew," McCullom shrieked as he removed the mask. "Ready for you, Jake."

Quennel knew Jake—Jake Cohen, the department's Chief Forensic Inspector. Jake was Jake, crabby, but one on one with even the lowliest clerk in the department. Nothing was sacred to Jake, including other people's right to breathe. He smoked big, black stinky cigars from dawn to dusk, in or out of the smoking areas. Nobody complained, Jake was the best, and the department didn't want to lose him. The city knew he could walk in cold and unemployed into any department in any city in the world and walk out as *their* chief forensic. Jake was that good.

"Pop that laser out, Mac—Lemme see what we got."

The laser was a sort of combination backpack-flashlight, low power, and red. Jake grabbed the barrel and began flashing it around. "Uh-huh," he grunted, "just as I thought."

"What?" Quennel asked in his most excited voice.

"Some slob's got fingerprint's all over the place."

"That's wonderful, Jake," Quennel replied enthusiastically.

"Yeh, ain't it?" Came Jake's riposte. "Now all we gotta do is find out whose

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they are, and whether or not they're supposed to be in here. Mac, gimme the camera."

The camera was actually a combination camera, computer and radio. As Jake swept it over the suspected prints they were recorded on tape, displayed on the tiny CRT, digitalized, and transmitted to the mainframe downtown over the police communication band. After scanning half a hundred examples, Jake shut the recorder off and placed it on the top of the desk. "Be a while," he said scornfully. "Five minutes at least, before we can get a reply. The department's goin' to the dogs. Nobody does nothin' in a hurry anymore."

"Uh, Inspector Quennel—what about that envelope under the drawer?" Ginger asked, just as a shaggy haired man sauntered into the room to interrupt her.

"I'm Barnhall," the man said. "What about an envelope, Ginger?"

Ginger pointed at the overturned drawer.

Quennell glanced over at Jake. Jake blew a cloud of smoke back at him. "S'all right, Inspector. If there's any prints on it they're set."

"That's a diskette, you oaf," Barnhall screamed, as he bent down and ripped the envelope loose. "If you've contaminated it . . ."

"The stuff we use only works on organic material, Turkey—and watch out who you're callin' names—and for all we know you coulda done this yourself to defraud some insurance company. You're a suspect, too, right, Quennel?"

"Uh—well . . ."

The accusation died a quiet death, since everybody knew the argument was over and that Jake had won it.

Barnhall was past caring by then—totally distracted. He whipped out the diskette, glared briefly at the label, dropped his jaw, and began drooling. After that there was no stopping him. He threw the power switch on the nearest terminal and shoved the diskette expertly into the drive.

By then the others knew that something extraordinary was taking place, but Ginger was the only one with the presence of mind to ask. "What's on it, Fred?"

Her answer came on the CRT as the program booted. Amber letters blazed out: "Omnilingual, Vers. 1.2—Copyright 1990, Benjamin J. Dover." Then, Ginger's jaw took the plunge.

"Will somebody tell me what's going on," Jake demanded, punctuating his words with a pall of pollutants.

Barnhill turned, retched, coughed several times and fanned the air. "Why don't you put that thing out?"

"Why don't you answer my question?"

Barnhall glared, but he could see that no one was going to ralley to his aid and that Jake had whole inches to go on his stogie. "All right. Dover used to work here—uh, as an employee, you understand, on salary—whatever he developed I own, no matter what he says." He gazed at the others, who by then were listening avidly.

"He—uh, he and I *jointly* developed Omnilingual, which of course, you're all familiar with because of—well, I guess he took it a step further, because this is apparently a new version. There are bound to be some substantial improvements over the old one. Ben was

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hard to get along with but he was brilliant—in his weird sort of way."

"I take it you didn't part friends," Jake replied, in a surprisingly civil tone.

"*He* accused *me* of *stealing* Omnilingual from *him*. Me, the guy who took him in off the street and paid him a big fat salary—ah, but I was smart enough to cover that—I made him sign a release when I hired him. Everything he worked on while he was here belongs to the company—and he had to keep whatever he knows confidential. It's legal, and it's airtight." He grabbed a box of diskettes from atop the terminal, flipped up the lid, thumbed through and selected one. "D'you mind," he glowered at Jake. "That smoke's bad for floppies. I don't want any of mine ruined."

That time Jake backed down, though as an interested observer Dewey believed it was because he wanted to check his instruments again. There was news, and Jake read it glumly off the screen. "Just as I expected," he growled. "Most of the prints are Dover's, a few are Barnhill's, and a few are Miss Chi's."

"H-how do you know they're mine?" Ginger stammered. "I've never been fingerprinted."

"Yeh, you have. I watched what you touched, Lady. Also, I got Quennel's, Mac's, Bermudez's, and the janitor's. I gotta be able to tell who's who."

Ginger was amazed, and this left Dewey an opening. "Insurance," he explained, "All the janitorial services print their people to get the reduced rate." He turned to Jake. "No mavericks, huh?"

"Inspector Quennel! Burglars are just people—the dumb ones don't last. He got in without shaking the alarm—the man was a pro."

Dewey was abashed. Surgical rubber gloves were all it took. Burglars bought more of those than doctors did.

"Yipee!"

This distraction was welcome, but totally unexpected. The crowd turned to face Barnhall, who stood with his legs spread and his fists clenched, in front of the terminal.

"Ginger, you gotta see this—it's beautiful. This does everything the earlier version did and uses only half the memory. It'll open up a whole new market." He raved on, muttering under his breath.

Ginger did approach, and glanced over his shoulder at the screen, which displayed the BIOS of the program.

Quennel was instantly at her side, rather closer than professional duties required and noting that she wasn't backing off anymore. "What's all this about?" He whispered, making sure to inhale deeply afterward.

"This is the program we've been selling to the big users, Inspector. It's an operating system that has basic compatability with almost every machine in use. Also, it has internal reference files that convert—uh, never mind," she interrupted herself, gazing up at him, "let's just say that if you're running on this system your equipment can talk to any other computer, anywhere, anytime. I'm sure you can appreciate what that means."

"Uh—y-yes, of course. Uh, why is *he* so excited?"

"Because the other, earlier version needed over a megabyte of memory in order to run. That's not much as main-

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frames go but it approaches the maximum for the average PC in use today—and you need some slack in order to run your other software. The new version gets by with less to leave that slack, so the market will expand and we'll sell more of them."

"Oh."

Barnhall turned, forgot his program for the moment when he saw Quennel and Ginger in their huddle, and glared at her. "Ginger!" There was both anger and authority in Barnhall's tone.

She fairly streaked over.

Barnhall handed her the diskette, which she accepted carefully. "Make some copies—and BE CAREFUL!"

Dewey watched her wiggle out of the room, then turned his attention to Jake. "What do you think, Jake?"

"I think we ain't gonna catch him," Jake replied. He paused to strike a sulphurous match and relight his cigar, carefully avoiding his generous nose. "At first I hadda gut feeling it was an inside job, Quennel, but no proof. That left me." He paused again. "Then, I figured on that alarm—which means a pro, but Barnhill didn't seem to be that worried, so I asked myself what a pro could possibly be after in a dump like this.

"Now, your regular run of the mill burglar grabs cash, or portable stuff he can fence, like jewelry in a home or equipment in an office. Don't look to me like there's anything missing in here—and a pro woulda taken something just outa pride. Finally, there's this mess."

He waved his hand at the floor. "This hadda be the noisiest, clumsiest burglar ever was. It don't fit with the alarm being off, so maybe he was the world's luckiest too. There coulda been other reasons why it didn't go off." He paused, threw up his hands in that age-old gesture of futility and said, "that's my theory—a lucky amateur. We'll probably catch him locked in at his next job, after that luck runs out."

"Inspector Quennel?"

It was Gomez. He was holding a cordless phone receiver. "Headquarters. Inspector."

Dewey took the receiver, and answered while holding a hand over his other ear to keep out the background noise, which was considerable. It wasn't enough, so he backed slowly out of the room and into the corridor. The sergeant he was speaking to had called to remind him he was due in court to testify later on that afternoon and that he should get in touch with the D.A.'s office right away. Quennel tried to write down the phone number but found he couldn't quite manage while holding so many things. He hurried out to the front of the building, where he found Ginger in her alcove office and bent over a terminal. He used her desk to rest his notebook while he wrote.

Somewhat awkwardly, when he was finished with the call he laid the receiver down also, just in time to see her turn and smile.

"You can leave it there, Inspector. I'll take it back. Are you leaving?"

"Uh, yes, for the moment. I have some important business downtown—uh, in court . . ."

"Well, it certainly was nice meeting you. I really like you. Come back and see us."

Quennel couldn't pass that one up.

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When he did finally leave, his notebook contained not only Ginger's address, but her phone number—and they had a dinner date for Friday night. He didn't know what had gotten into her but he was grateful for whatever it had been.

"I told you, Ben, you haven't got a prayer of busting out of that thing—it's airtight, just like Barnhall's lawyer says, and what's more it's industry standard."

Dover glared back across the desk at Berger. Bill was a good lawyer but he *was* a stubborn cuss. Once he got on something he didn't quit, and he was convinced Ben didn't have a case. "I don't care, Bill. I want you to try it anyway. Did you ever stop to consider that maybe I know something you don't?"

"Yeh, like what?" Berger replied, rather more curtly than he intended. "Like maybe the guy's conscience is going to hemorrhage when he takes the stand."

"Yeh," Ben replied, glaring. "Maybe something *just* like that. Look, Bill, I know how you feel and I know you're trying to look out for me, but you've got to do this. I'm willing to pay up front, what more can you ask for?"

"Then *my* conscience would hemorrhage, Ben. It'd be stealing."

"I can find somebody who will." Ben's glare intensified.

Berger paused and reflected. "Yep! I guess you can, Ben—I know you can, considering the current sorry state of my profession. Yeh, you could have people jumping out of alleys if you put that word out. Might's well be me that puts you down, friend, you've got a point. At least I'd leave you eatin' money."

"Now, that's what I call a more reasonable attitude, Bill. How soon can you file?"

"Today—nothing to it. It won't matter what I say, his lawyer'll hit me with a motion for summary judgment soon as he's served and that'll be it—bang, we're out of the box."

"Wait a minute, Bill—on second thought, we don't need to go that far—maybe. Didn't I hear you say once you can take a d-depo . . ."

"Deposition?"

"Yeh. Didn't you say you could do that before you file?"

"Uh, yeh. Proper circumstances—yeh, the rules do say that you can use discovery in advance of trial, but it's tricky, Ben. And, if they decide to ignore us we'd have to file anyway in order to enforce the right." He paused, and fell into deep reflection, as though he was groping for just the right thought. Finally, he found it. "Brilliant, Ben. I'm ashamed of myself that you had to tell me. It's dead certain that a court would insist on Barnhall submitting to deposition before it heard any motions. We could argue . . ."

"How much do you need up front, Bill?"

"Mr. Barnhall, I'm going to show you what has been marked as plaintiff's exhibit eight, and ask you if you can identify it." Berger slid the paper into the clear plastic sleeve that would hold it flat and zoomed the auxiliary camera down on it. On the right half of his screen he could see the image.

"It's out of focus on our end, coun-

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sel," came the voice of Barnhill's lawyer through the speaker.

Berger twiddled a knob. "How's that?"

"Better," Barnhill replied.

"Can you identify the exhibit?"

Barnhall's face filled the left half of the screen now. His brows were knit, and his lips were in a scowl, as though he were struggling to remember.

Behind Berger sat Ben Dover, slumped back in his chair. His lips were also animated, but they were twisting up into a smile.

For a long time there was silence. Then Barnhall answered. "This is the agreement Ben Dover signed when he hired on with me."

"Does his signature appear anywhere on the document—uh, assuming you are familiar with his signature," Berger added, alert to avoid an objection.

"Yes. He signed it."

"You were present when he signed it?"

"Yes."

"Did you give him a copy?"

"No."

"Why not?"

"I wanted to alter the document, so I told him that it was the only one I had. I promised him a photocopy later."

Suddenly, the screen went blank. For long moments Berger glared at Ben, who snickered uncontrollably, slapping his hands alternatively down on the table top and upon his thighs. Then he became aware his mouth was hanging open and he closed it.

He was about to open it again when the phone rang.

"Hello."

"Mr. Barnhill's lawyer is holding on line five, Mr. Berger," the secretary's voice piped.

Berger smashed his finger down on the button for line five, and also threw the switch for the loud speaker. "Yes?"

"Trouble with our video equipment, counsel. Can we set this over to another date?"

"Uh, Bill, I think what the man is trying to say is that he wants to stall because Fred insists on confessing to what he did and he sees his fee flying out the window, that about right—counsel?"

"Tell your client to shut up, Berger. You know I can't answer that."

"Maybe," Berger replied, "we should both send our clients out of the room and talk privately—perhaps we could discuss settlement possibilities?"

Ben's head was nodding up and down, and he already had his hand on the doorknobs. When he finally did get an answering nod from Berger he loped out.

"It doesn't matter to me at all, Fred. It's not *over* between us, there was never anything there to begin with—not as far as I was concerned." Ginger had a box of her personal effects sitting on the top of her desk. She had been about to leave with them when Barnhall walked in on her.

He glared back. "You certainly put on a good act."

"Right—and that's all it was. I was a fool. I listened too much to Grandma Chi, and Grandma had an old fashioned idea that a girl ought to look for security. I was about to dump you anyway until you got Omnilingual. I hung on because

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of it. Now your selfishness has cost you that. You're through, Fred."

"I suppose you'll run to Ben now that he's the one who's going to have the bucks?"

"Not a chance. Dewey Quennel's the only man for me. I'm really hot for him, and I don't care what Grandma thinks."

"I hope he's not expecting a virgin."

"He isn't. I've been completely honest with him, and he's been honest with me. We made a deal—no secrets, we laid it all out, both of us, warts and all. We're going to get married as soon as his divorce comes through."

"You believe that?"

"Dewey's a truthful man. So, I heard, are you—now. I like truthful people, but I'll make you my exception. Good-bye Fred. I hope you have all bad luck for the next thousand years."

Cindy Withers was what was known in the trade as a "panhandler" and her "Curl Up and Dye Shoppe," located in a small but tastefully appointed shopping center off Bee Cave Road catered mostly to elderly matrons from the high income Rollingwood Heights subdivision. It was a gold mine, and Cindy knew it and she knew that the way to keep the green rolling in was to reinforce the thoughts her customers already harbored in their otherwise hollow little heads. She, and her people, had developed the technique of flattery into an art.

Cindy was doing so well she didn't get her own hands dirty any more. She had eight operators in the shop, slapping the sticky, odoriferous mud on the seemingly endless acres of sagging chops. The mud was expensive, imported from France—Cindy didn't really know the details, though she suspected that in their finest national tradition some enterprising pig farmer over there had found a new way to sucker Americans.

Today she was doing the books. Cindy always did her own books, particularly the tax parts, on which she didn't trust her accountant to be conservative enough. Today was the 12th and the second quarter estimates and payments were due on the 15th, along with the withholding and her "contribution" to the unemployment fund.

Fortunately, with the new program the accountants were using she could dial the phone and tap directly into her ledgers, so it wasn't like she had to spend hours figuring with pencil and paper. It galled her more than a little bit that although she was doing most of the actual work, she and a dumb computer program, they would bill her as though they had done it.

She finished rather sooner than she thought she would, but her feeling of irritation grew. She came very close to calling the accountant's office and suggesting that he shave his next statement.

She resisted, went into the coffee room and poured herself a steaming cup—black, hot—and bitter. She shook half a shaker of sugar into the cup, stirred it and then flicked the heater off its "boil" setting and back to warm. Stupid people! Her employees didn't seem to realize that they had to take care of the equipment she provided to make them more comfortable on the job. She actually resented the fact that somebody had ruined the coffee by using a setting meant for heating soup. *What is the*

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matter with me? She asked herself. *You're getting to be a cranky old bat yourself,* came the answer. *Look at you—why, you'd be flat-chested if you lost all that ugly fat.*

Cindy would have been furious if anybody else had said that. It was the truth, but it still hurt.

Seeking diversion she wandered out onto the floor. Irma Ramiriz was standing on her padded step so she could reach high enough to work her customer's facial. Cindy recognized the woman underneath the mud—Mrs. Bennett, the wife of a prominent district judge.

Mrs. Bennett, staring upward through the holes in the pack, greeted her warmly. "Good morning, Cindy. How've you been?"

"Lousy."

The shocked look that washed over Mrs. Bennett's face was clearly visible even through the mud. "Oh, I'm sorry to hear that."

"I don't believe you," Cindy barked. "Why should you care how I feel?"

"Well, I never—!" Mrs. Bennett had greater agility than might be expected from a woman her age. Instantly, she snapped bolt upright, feet dangling over the edge of the couch.

"I can see why," Cindy remarked, sipping her coffee noisily. She turned to Irma. "Give her the works, Shrimp. Who knows, it might even help. It certainly couldn't make her look any worse."

By then, the customer was on her feet, grasping at a towel and trying to scrape off the mud. A crowd of both Cindy's employees and their own charges had gathered, horrified, stupified. But aside from Cindy and Mrs. Bennett, there was dead silence.

"My husband will get you for this, you upstart," Mrs. Bennett roared, shaking a finger at Cindy.

"It won't be the first time *he*'s had *me*." Cindy sneered. She paused for a suitable interval to let that one sink in, then continued. "Don't look so shocked. You'd be surprised how many other girls could say the same. Where do you *think* your money goes, anyway?"

"Are you implying that he's using *my* money to . . . ?"

"Certainly not. I'm stating an absolute fact. How do you think I got the financing for this place—I didn't have any credit. I didn't have two nickels to rub together when I hit town."

Suddenly, Cindy noticed the solemn crowd. For an instant, she almost weakened. Then she found new strength. "Well, why not? How are any of you different? Not a one of you can say you live life without considering your own welfare first—not a one. You—you women—you live in fancy houses, up there in the hills—you didn't all start out prosperous like—like she did. You all traded what your men wanted for what you wanted. Be honest about it—"

Suddenly, Cindy's will wilted dead away. She dropped her face into her hands and moaned—"My God! What have I done?"

But it was too late to change the words. One by one, like so many ancient, misshapen zombies the customers turned away, some reaching for towels, some assisted by silent sympathetic operators, who did not know what to say, and so said nothing.

* * *

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"Well, actually, Mrs. Nowells, since you asked, we didn't really have a specific reason for calling this audit, we just like to fish troubled waters, if you know what I mean."

"No, Mr. Danke, I'm afraid I don't know what you mean. Perhaps you'd better explain yourself." Dorothy Nowells was no dummy, and she had long suspected the average IRS employee was genetically different from the rest of the citizenry. At the moment, as she glared at Mr. Danke, the superficial human image faded and beneath, in her mind's eye, she saw him as the larval form, a slimy, crawly maggot. She held the tiny tape recorder even tighter in her trembling right hand.

Danke gaped at it, and his hands flew up to cover his mouth.

"What is it you want of me?" Dorothy demanded. "Talk, Sucker. State your business, but do it in the next hour, because when this tape runs out, I walk out. Tell me about this fishing expedition."

"We-well, Mrs. Nowells, it's not my doing. The computer—the computer kicked your number out—you fit the profile as a likely candidate for audit . . ."

"Why? Because I'm female? Because I just divorced a wealthy foreigner, because I happened to like living in Switzerland. . . ."

"To tell the truth, yes—all those things. We . . ."

"Just got a hunch, right? So you decided to pull me in; to hold an inquisition and do some digging? Is that it?"

"Well, yeh, sort of. God, they'll get me for this. Please, Mrs. Nowells, shut that thing off. Look, we can work this out . . ."

"You better believe it. We can work it out right across the street, in the District Court, where they still believe in the constitution. Come on, Mr. Danke," she screamed at the cowering IRS auditor, holding the recorder high. "Tell me; tell the world how you're going to violate my civil rights . . ."

"I—I toldja—It's nothing personal—it's just policy . . ."

"Go on—it's agency policy to violate people's civil rights?"

A sober look washed over Danke's face. He stopped talking and squinted at Mrs. Nowells, his eyes following the slow revolutions of the tape reel in the recorder's tiny cassette.

When he spoke again it was clear that he had made a value judgment, and that he had decided not to take the rap for the department. "Yeh," he said at last. "Yeh, I guess you could say that. We all go to these classes, you see . . ."

"Yes," Dorothy purred. "Go on—you can take your time; I lied. I've got some extra cassettes."

Fred deeply regretted his failure to do the same. "Uh, yeh. Well, they got special instructors. You know, experts—I mean these are the *best* people money can buy, I mean, smart! Anyway, the idea is, in this business the customer is always wrong. They figure most people got a little larceny in them, and you know, it's the government, and the government's got a lotta money, and all—so. You got the idea? Hit 'em, make 'em crack, we got time on our side, and we design the forms and write the instructions. Statistically, sooner or later

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everybody makes a mistake." He paused, leered.

"And then, wham, we're in. From then on—well, every once in a while you run into a fighter—like yourself, but . . ."

"What about mistakes in the other direction?"

"Huh?"

"Doesn't it ever happen that people overpay—because of error?"

"Oh, yeh, sure. Sure—it happens, but we let them worry about that. I mean, after all, we got enough to do."

"That's part of the policy?"

"Far as I know."

"You personally know of instances where the government kept quiet?"

"Sure. Look, Mrs. Nowells, I'm in enough trouble already. Couldn't you just accept my apology and go home?"

"If I did, would that end this travesty?"

"Uh—probably not—you see, I get reviewed, uh—sort of second guessed. We all do . . ."

"Policy?"

"Uh, yeh; you see, they worry about us taking bribes and . . . "

"That's to stop stuff like that?"

"Weeell . . ."

"Come clean, Fred—mind if I call you Fred?"

"All right. No, no; that's only part of it. They sometimes take another shot or so."

"That's legal?"

"Sure." There was another nervous pause. "I mean, nothing like keeping things stirred up—and, it is a discretionary thing, you know. It's not like it's carved in granite somewhere. I might not think you're guilty but my boss . . ."

"Might have a hunch?"

"Yeh. So he puts somebody else on it and bingo—I know of a couple of cases where we pushed the same claim five—maybe six times."

"It doesn't sound very efficient."

"What's efficiency got to do with it? This is a government agency."

"Yes, I forgot. Fred, you do know I'm not a total parasite on society, don't you?"

"What's that supposed to mean?"

"Hmm. Well, I guess maybe you aren't a literate type—no, you wouldn't be. TV's your bag, right, sports and stuff, that about it?"

"Yeh—yeh, I like to watch a ball game now and then—Saturday afternoon's—maybe guzzle a few beers. So what?"

"It's been a long time since I wrote a book, Fred, but you know, I think I'm getting the itch. Let's talk, Fred. I promise I won't repeat anything publicly—right away that is. After all, you really have to work to get the Pulitzer, and I don't have nearly enough tape with me . . ."

"Are you suggesting something illegal?" Fred replied warily.

"Certainly not. Besides, what harm can there be in a little socializing? You already admitted you have nothing on me. Your very words are right here on this tape. Now, why don't you just tell me what your home address is, and give me your phone number? Uh, by the way, are you married?"

"Yeh, I am. Wh—"

"Don't worry. I'm not after your body, Fred. I like you for your mind,

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that's got all that nice, interesting, Pulitzer type information in it—Fred, I'll even share the byline and the prize."

"Now—now that's a bribe," Fred squealed, shaking a pudgy finger at her."

"I *don't* think so, Fred, but you might want to check with a lawyer. I'd recommend you get one in any case." Dorothy rose, stretched, accentuating an already fairly impressive bust, and turned to go. "How about Saturday afternoon, Fred, at the public library. You know the branch on the south side, Congress and . . ."

"Yeh, yeh. I'll be there. What time?"

"What time does the ball game start?"

"One P.M."

"Make it one, then—bye!"

She was gone. Fred was alone, in his little cubbyhole office—that might have a bug in it for all he knew—he wouldn't be surprised if this sneaky bunch —*FRED! You're one of that bunch!*

Suddenly, he was shivering—shaking —covered in a cold sweat. The magnitude of what he had just done finally registered. He had committed occupational suicide, maybe even committed a crime—*WHY?* What kind of hold did this woman have on him—was she a witch or something? Was it magic?

He had to think—morever, he had to evaluate. He needed time for both. He picked up the phone, punched the intercom button to get the front desk. The receptionist answered on the third buzz. "Hold it up for a little while—I gotta hit the regs."

Fred put the receiver down in its cradle, turned, and switched on the computer terminal. The CRT lit and prompted. Fred typed "menu," and hit CR, and an instant later the list appeared.

It took him a while to get into the civil service regulations, which were voluminous, badly indexed and complicated, but he did it far easier than he had the last time, when the same operation had consumed half a day. Thank god for good old beaucratic opulence, he moaned in a whisper. The new Omnilingual operating system they got last week had cost the taxpayers dearly, but it was certainly worth it.

"Kate!"

"Yo."

"It's lunchtime. How about you and me go out and get some? I'll treat."

Silence.

"Kate? Whaddya say?"

Kate Torres had been chewing gum. It was a fairly new piece, and still quite stiff, so it hurt a little when she swallowed it, and for a while it was physically impossible for her to talk. But it didn't matter. She couldn't have said anything anyhow. The invitation struck her like a bolt out of the blue. Twenty-eight years, since the war days, she'd been associate editor to John W. Gamble and he'd never so much as taken her out for coffee.

John was a direct sort. Her silence must have intrigued him, since the next thing she knew, there he was in the doorway of her cubicle, smouldering cigarette in the long holder, running a hamlike hand over his bristly crewcut.

Kate gulped. He was serious, and she was puzzled, so excuses seemed appropriate. "W-we can't both go at once. We'd have to lock the office."

"So? Who's gonna care. That's why

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I want to get out, Kate; why I want you and I to talk, without any interruptions from the phone or anything. Kate, something's wrong—you know it and I know it."

Those seemed to be the magic words. Without further ado Kate rose, walked to the coat tree, slipped her light spring jacket off it and onto her thin shoulders, smiled toothily and said, "be sure you've got your key."

They rode the elevator to the street in silence, except for some small talk with Stanley, the mailroom boy, who happened also to be on his way out.

They didn't go far, just around the corner to the Beanery. John didn't really want to eat but he didn't want to spoil things for Kate, so he sat there drinking coffee in silence until she finished—and then he let her have it.

"Four-hundred twenty-two fact articles, Kate. All in one month. That's as many as we used to get in three months, and over half of them from people who never thought of sending us anything but fiction before. And Kate, most of them are awful."

Kate's expression became contrite, as though she imagined it were her fault, though of course it wasn't and she knew that wasn't John's implication. All he wanted was a sounding board, to help him think. He'd always used her—and most everybody else—that way, even before *Epilogue* became *Epilogue*, back when it was *Astonishing Science Fiction Stories*, back in the great recession, when it had been foreign owned, by Strasse und Schmidt, GmbH., when they had sometimes been paid in pumpernickel and knockwurst from the company's foods division, which shared the building. *Times have changed,* she thought.

". . . and have you seen the size of the slush pile? There's nothing to it. What there is is stuff I ordinarily wouldn't look at long enough to read the title —except," he paused, coughed nervously and adjusted his horn rimmed glasses, "except that's my only hope —now."

"I—I never noticed, John. But, of course, with all the articles . . ."

"I know, I know. Very deceiving. Kate, you know what else I did? I called a few of the regulars, Silverbaum, Handlon, Horaceson, even Amazov—got him at the hospital—how that devil managed to get himself a phone in ICU—well, all I got was excuses —'nothing working, John— except —hey, how about an article on'— that kind of crap."

Kate was a good listener. She had to be. Once John got started, the chances of anybody else getting a word in until he was good and ready were slim indeed, not that he was overbearing about it, he just had incredibly good timing. Nine times out of ten the only times he paused were when she was inhaling, and then, of course, she couldn't speak until she could exhale, by which time the opportunity was long gone. She waited patiently until he asked the inevitable question.

"We've got four filled issues to spare, Kate. They're all at the typesetter right now. We have to get more stories. If they don't come in the mail we'll have to write them ourselves."

"John, I . . ."

"Which brings me to another question—I did find a fair handwritten

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job—not quite up to par but I think the kid has the right idea. I'm going to ship it back express mail and suggest some changes but I know he hasn't got a typewriter so . . .''

''Could I type it? Sure, John. What else have I got to do?''

She seemed a little cool after that, but under the circumstances John didn't really notice. They walked back to the office with little conversation and once there John assaulted the slush pile again. He found two more ''just barely passables,'' that he thought might be tuned up to mediocre, and took the chance. A week before he would simply have paper-clipped a form rejection to them and thrown them in Kate's in-basket. Now, he had to use what he had because there wasn't any more.

It wouldn't have mattered. When the next issue hit the streets well over 90% of the copies came back unsold, leaving the subscribers to foot the entire overhead. And subscriptions themselves had the worst month ever. John wasn't the kind to noise bad news around, but then he'd never really had to learn to handle it. Heretofore there hadn't been much bad news at *Epilogue*, but as Kate was saying more and more often these days, times had changed.

It wasn't just *Epilogue*, either. It was everybody—everybody who depended on fiction to sell. Non-fiction was okay. The company's news magazines, and its other main lines, several how-to magazines, sold better than ever. For the first time in thirty years, John W. Gamble worried about being unemployed.

Here in the family quarters things were relaxed. There weren't any shorthand reporters, photographers, aides, or busybodies around. So protocols were different—what down there in the oval office was ''Mr. President,'' and ''Mr. Attorney General,'' was up here George and Ed.

Of the two, Ed, strangely enough, was in the worst shape, perhaps because he had less assistance in handling his job and had to do more of the donkey work himself. But from a strictly unbiased standpoint neither one was very happy in his job anymore and the reason was that the whole country suddenly seemed to be in a moralistic turmoil. There was conflict and dissention everywhere.

''There's conflict and dissention everywhere, Ed—everywhere I look,'' George complained. ''No sooner do we get done with one crisis than we get a bunch of more nuts harping about something else. Treasury's in a shambles—the IRS has collapsed. This morning, the Federal reserve board said we'll have to raise the discount rate just to borrow enough money to keep the country running. State says Victor Krapov got sore about something our negotiator said and they think he's about to walk on the disarmament talks—half the people on the government payroll seem to be writing exposé books about the other half in their spare time—it goes on and on.''

''George! Don't get yourself so worked up. Take it easy. It'll be okay.''

''They said I wasn't big enough for this job, Ed. Maybe they were right—if this is a test . . .''

''Now, how could it be a test? George, think that out. There isn't any force on Earth big enough and powerful enough

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to shake this bureaucracy of ours, not even the Russians could do it."

"They're sitting back laughing at us. I read the memos state sends over. I know what they're saying."

"Don't pay any attention, George. Things have to get better—they . . ."

"Can't possibly get any worse." This time it was the president who scored a coup, by finishing the attorney general's sentence.

"George, trust me—don't worry. The people like you—they're not blaming you for any of this. You're too transparent to be a liar, so they trust you and they believe you. Now, Congress; Congress is something else, isn't it."

"That's another thing, Ed. I don't understand that either. You've got fourteen senators under indictment and twice that many more under investigation, and some of them are even from *our* side of the aisle. And—they're all senior—they all should have known better."

"Old dudes get horny too, George. Senator means "Old Man," in Latin, but maybe "dirty old man," would be a more literal translation. . . ."

"Three of them are women, and all of them are thieves according to the people who informed. I read *your* memos too. Ed, tell me the truth, are you on some kind of crusade?"

"Not me, George, although I've bounced that theory off a few skulls too, including some of the guys over at the CIA. If that's it it can't be anything that's very well organized or one of us would know. Spies and G-Men don't seem to be immune—we've got our own blabbermouths. Why, these days, before I even think of leaving the office I turn my pockets inside out in case I put a government ball point in one of them by accident. No, George, it seems to be a whole lot more fundamental than that. There are some memos you don't see that maybe you ought to. Memos I get from my field people. There's some good features to this as well as bad ones, George."

"Zat so. Well, gimme—I need a fix."

"Crime's well, not really down—actually it's up—but, George, statistically that's predictable when more are reported. The really interesting thing is the number cleared. Apprehensions are way up, so are convictions, and—listen to this, almost all are on guilty pleas. If this goes on I can lay off half my prosecutors."

"You know what I'm gonna do, Ed?"

"What?"

"I'm gonna appoint a commission—I'm gonna have them make a study of this, even if it gets me the Golden . . ."

"Don't worry about him, George."

"Why? Why shouldn't I worry. I know he's a nut, but he's a nut with power, and . . ."

"*And,* he's one of the dirty old men who got himself ratted out," Ed purred, with obvious relish.

The significance either didn't register or George was the equal of his reputation as a worrywart. "Yeh, well, anyway, it's a darn shame the president of the United States can't be better informed about the state of the country. I'm gonna find out why not and raise the dickens until things are better."

I believe you will raise the "dickens," George, Ed muttered under his

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breath. *Me, I'm gonna get a little rougher than that.*

"Morning, Harry."

"Sit down, Jed."

Jed Hoyle was nervous enough without his old friend Harry Winters making it worse by acting so stiff and formal. Sitll, for old time's sake he flopped down into the leather-covered chair in front of Harry's desk and tried to feel relaxed. Why, he asked, himself, did banks always have leather furniture? It was *so* cold and slippery.

Harry was sitting there with his hands folded in front of him, his blue pinstripe suit without wrinkle or blemish, his tie perfectly knotted in an impeccable windsor, his mustache neatly trimmed and waxed and every hair on his head absolutely and faultlessly in proper place. He had not moved since Jed sat down.

"Well," Jed said finally, after enduring it as long as he could. "Aren't you going to say anything, Harry? Like why are you here, Jed—maybe?"

"I know why you're here, Jed."

"You do?"

"Yes. You're here because you haven't been selling enough cars and the manufacturer's pulling you off their floor plan."

"Uhm, yeh. That's about it, Harry."

"And you intend to ask me to recommend to the lending committee that we finance your stock."

"Uh, yeh—yeh, Harry, you're right again. Y'see, we've been in a slump for some reason. I really don't understand it—the economy's supposed to be all right—I mean, the president's always on T.V. saying there's no recession or nothing. . . ."

"Can't do it, Jed."

"Why?"

"Because they don't meet until 3:00 P.M. Friday afternoon."

Jed relaxed a little. Harry's humor was extraordinarily dry and sometimes it took a little work to catch on. "Gotcha, Harry. Harry, can I bring my family over to live at your house until then—I mean, so they won't starve. . . ."

"I'm not kidding, Jed."

"I—I don't get it, Harry. Why're you acting so goofy? What does a couple of days have to do with it? My regular plan's good until the end of the month anyway. They're not going to repossess me or anything."

"The bank examiners will be here Friday morning at opening time."

"Again, so?"

"I'll be dead."

"What?" Jed was now bolt upright in the chair. He'd never known Harry to carry a joke this far. Then he looked into Harry's eyes from the new perspective and his blood ran cold.

"Harry, what's this all about?"

"I'm going to kill myself, Jed."

"What?"

"The insurance money will pay back what I embezzled, and hopefully leave a little for my own family. Unless, of course, they levy fines."

"You—you st . . ."

"Didn't mean to, Jed. I—I looked at it more like a loan. I got hooked on the commodities market, I mean really hooked. At first I was careful, and started out slow, and I made a killing or two. But then I got greedy, and —well, you know the rest."

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For a long time, Jed was unable to respond. The sight of Harry just sitting there with his hands folded in front of him, calmly discussing his plans for suicide just shorted out his thinking apparatus. Instead of wondering what he should do, and who he should tell, Jed became preoccupied with another question. "Why are you telling me this, Harry?"

Without moving, Harry answered, promptly, and in a calm voice. "You asked me."

"Yeh—yeh, I did. But why'd you say what you said? You coulda told me anything. How would I know any better?"

"I—I couldn't, Jed. It just wouldn't have been right to lie to you. Besides, it's probably better if somebody knows—I was going to leave a note, and say I was sorry, and all, but now that you know—Jed, you tell them."

Jed was on his feet by the time the sound of Harry's words faded. "No," he screamed. "Harry, I'm not going to let you do this. I'm going to stop you." He turned, heading for the door almost at a trot.

The door burst open. Harry's secretary had heard the shout. Behind her was Charlie Arbeiter, the bank guard, his hand hovering near his holster. "What's wrong, Mr. Winters?" The guard gasped. He was an old geezer.

"He—he's going to—" Jed had turned to see what Harry was going to say.

There was a snubnosed revolver in Harry's hand—appropriately, a .38 caliber Banker's Special. It was pointed at his temple.

Everyone froze. Everyone was silent except for the secretary. "Are you going to shoot yourself, Mr. Winters?" She asked blandly.

"No," he answered, lowering the gun.

"Why not?" she asked.

Jed's jaw hit his collarbones hard enough to bruise them. He'd never heard such a callous remark. Nevertheless he listened to Harry's reply— astonished that Harry did reply.

"There's an incontestable clause in my insurance policy. It's up the 23rd of this month. That's this Wednesday. After that they *have* to pay off, even for suicide."

The guard seized the gun from Harry's limp hand, then he led Harry over to the leather covered couch in the far corner. "Aren't you going to do anything to help?" He screamed at the secretary.

"I'll call the police," she answered, and stalked out of the office.

Jed was left alone with the guard, and as Harry, in his present condition was pretty well out of things, they let him be and tried to recover from the shock. They talked in whispers, and Jed filled the guard in on what had transpired, though he omitted Harry's confession.

"There's lots of funny stuff going on these days, Mr. Hoyle. These are strange times."

"I'm having an awful time myself," Jed answered. "I used to think I had a pretty hot sales force but I'm the only one who seems to be able to sell a car these days. Customers come in hot and go away cold. My guys can't seem to hang onto them. Coincidence, probably, though it's the most incredible run of bad luck I ever saw."

"How many salesmen have you got?"

"Eight."

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"Pretty steep odds. I don't think that's it, Mr. Hoyle. Course, me—I'm old, retired from the army—never did have much in the way of education, but I been around people a while—took this job for that reason, so I could be—don't need the money. Anyway, I've seen the world change a couple of times. Betcha that's what's happening now."

"Could be," Jed acknowledged.

"Yeh," the old man rambled. "I remember the way things were before the war—that's *the* war, you understand. People had more morals then—wasn't none of this 'I got mine, t'hell with you', stuff, no sir, things was straight up, then. We're swinging back, is all. People are starting to recognize the value of truth and honesty again." He gazed earnestly at Jed.

Jed was about to bolt. He didn't like lectures, especially moral lectures. He heard enough of that kind of stuff from dissatisfied customers. The arrival of the regular police saved him from one. A patrolman arrived just before the ambulance did, and a crowd had started to collect at Harry's doorway.

The ambulance crew rolled Harry onto a stretcher and carted him away, and then the cop approached Jed.

Jed wound up in the squad car out front, telling the story again while the cop typed his report onto the computer screen.

"Neat little gadget to have around," the cop remarked, "specially now that we got that new program. Sure beats fooling around with paper forms."

"I don't mess with computers myself," Jed replied. "I got them in the office for the troops, but I'm strictly a pad and pencil man myself."

"Uh, we've come to the hard part, Mr. Hoyle. We've had quite a few cases like this lately, and well, I know you guys were friends—did he maybe tell you what the trouble was?"

Jed had not mentioned the embezzlement part to anybody. He had had no intentions of telling on Harry because he didn't see how this could possibly help, and he didn't see how giving Harry's family a couple more relatively good days could hurt. Besides, the bank examiners—

"Harry was stealing from the bank. He was playing the commodities market, and losing."

Panic struck Jed. Why? What had gotten into him? Why had he ratted Harry out? He sat there in a veritable puddle of regret, staring at the flashing cursor on the cop's terminal, feeling sorry for both of them. But somehow also, he knew that if he had another chance—if asked the same question again, he would give the same answer. The old man, he mused, was a pretty shrewd observer.

Jon Luningham, *Dr.* Jon Luningham was well placed. He was from the right political party, the right college and in the right specialty, political science, to get the chairmanship of the Presidential Committee on Civil Unrest. Harvard could rest easy. Professor Luningham was in command.

But, that only lasted a few minutes, until the committee got down into the meat of the matter, and then aspersions were cast on data and fur began to fly. After that, one by one, they ganged up on Jon, though in fairness there was some justification.

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His first mistake had been to tell Valerie Pigg, a psychologist, a female, and a black, that her data was all minority oriented and didn't relate to the problem. She called him an opinionated old goat, a male chauvinist pig, a honky, a fascist, a communist bircher, and a number of other, less printable names.

When he countered she gained allies from the other minorities: Basilio Postnikoff, for the mideastern ethnics, David Goldstein for the Jews, and Domingo Mungia, for the Hispanics. As it turned out, Luningham, together with Arthur Riddle now seemed to constitute the minority.

So, he made peace, ate a little crow, and resorted to rule by majority opinion instead of fiat, knowing that as chairman he was the final editor and arbiter of the commissison report—which would be the historically significant part.

After that, things got rolling nicely.

Goldstein's report led off. He had studied the genesis of the situation. "It seems," he began, "to have started about a year and a half ago, some place in the southern midwest. In any event, trends are not apparent in any other areas quite so early as they are there. This data is unreliable for that reason and for the reason that so much of it was reconstruction.

"On a more modern basis, it's pretty clear that the country's undergone a fundamental psychological change. People are more outspoken than they ever were—they've become almost childlike in simplistic truth—uh, and incidently that may explain why the first apparent trends in this direction were detected in rural west Texas.

"Using an automated model, my researchers have been able to stratify the population by age group and occupation. There are, by the way, no discernable racial or ethnic indicia of any importance in our model.

"Children are affected, though again the data may be suspect, for obvious reasons. For older children there is some slight evidence that family affluence plays a part. The same is true of school systems, with a greater effect on children attending the more affluent, better equipped schools.

"Among high school students these differences flatten out. At the college and university level the incidence of the effect approaches 100%, but it does not equate with general audit population trends. This is the puzzling part.

"Among the general population the effect is seen mostly in the professional white collar and scientific occupations—as you are all aware that government has been severely affected. The same is true of most retail businesses. We have not been able to determine why, but the data are supportive of certain conclusions. The first of these is that education, age and type of employment are factors. The second is that there seems to be both an upper and a lower limit. The elderly are almost unaffected. The very young are almost unaffected. Between those extremes there is wide variation, but the one definite generalization we've been able to make is that the chairman of the board or the president of the company is more likely to tell you a lie than anybody who works for him. We don't know why that is—yet. My rcommendation to this commission is that further studies be made on a national level."

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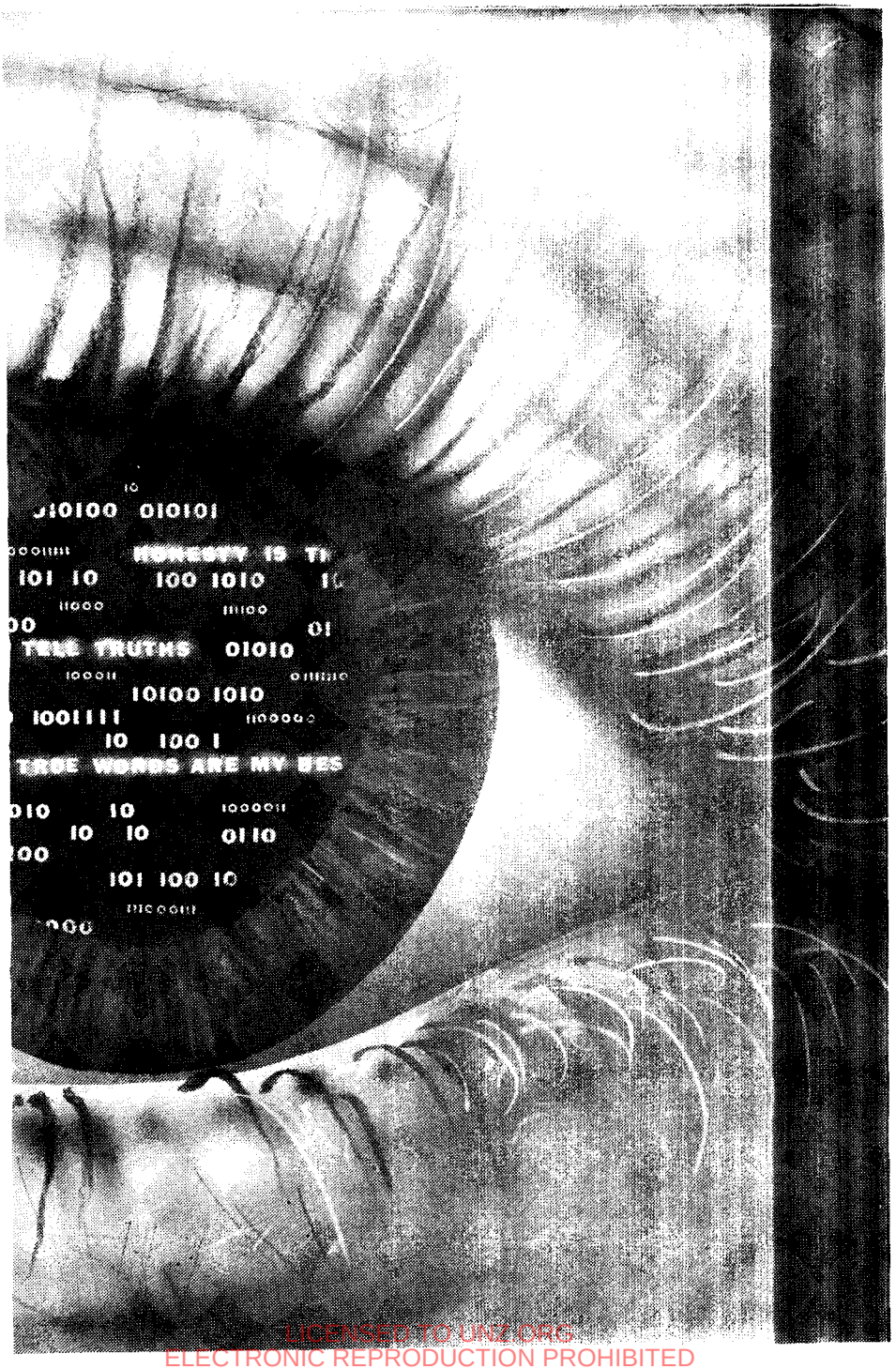

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The committee next heard from Domingo Mungia. Domingo was also a political scientist. He had less data than Goldstein, though like Goldstein his model confirmed the stratification along educational and economic lines. Unlike Goldstein's it purported to include some studies of illegals, who were relatively unaffected. He stated as a conclusion that he believed gender was a factor, at least among Hispanics, the data being indicative of more truthfulness among the women than the men.

Goldstein criticized Mungia's data because of small sampling, but it was music to Valerie Pigg's ears. Her data, her conclusions as to the effect of gender was almost identical. It also agreed with Goldstein's conclusions as to economic stratification.

Luningham thought he foresaw a fairly solid consensus shaping up. Certainly, any time you could get three such mercurial temperaments with such diverse backgrounds to agree on anything you were lucky. But Arthur Riddle spoiled the whole thing.

"I'm a criminologist," he stated adamantly, "and I look at things a little differently than you people do. I use statistics—I have statistics. I too have created a model, but my model only measures concrete things, like the number of crimes committed, or, more properly, reported, the number solved, and the type and severity of the punishment the perpetrators get. Criminology is a predictive science. None of the rest of you can say that about your specialties. I predict that if this goes on, if it spreads to the rest of the world, then by the end of the millenium the human race will be extinct."

Howls rose. Valerie Pigg repeated her litany, substituting only his name for Luningham's.

But Luningham and the others succeeded in shouting her down within a couple of minutes. Thereafter, she sulked.

"Hear me out," Riddle pleaded. "I'm not making this up. My model extrapolates from solid, well founded data. I have the numbers you guys don't have, though it may interest you to know that within relatively broad limits my model largely confirms many of your general conclusions." He paused long enough to let that sink in and take a gulp of water from a cloudy-looking glass.

"Now, let me illustrate: in those same categories you set out my statistics erect two pointers, first that crime is up, and second that more criminals are getting caught. I think these two pointers will ultimately merge into one—the reason is the same in both cases.

"Also, more criminals, once caught, confess and plead. This is a significant change. Also, there's an interesting side effect in that. While the police have always routinely asked a confessed criminal about his other crimes and those of his acquaintances they are now getting an absolutely stupefying volume of good leads—really truthful answers.

"Now, I know you're all wondering why I said what I said about extinction. That is, I will admit, still on relatively shaky ground, but—it is my considered opinion that data supportive of this conclusion will soon be conclusive of itself.

"Here it is, and I hope you'll all hear me out, and try to apply your own data to this where it is appropriate. You see,

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we criminologists categorize not only crimes and criminals, but motives and intentions. Motives are important in this field, even though their origins are highly emotional. Statistically, if we understand and can measure the extent to which motivation affects criminal tendencies we can set up predictive models that tell us all kinds of things. This is what we've done, and like they do in many cases these new trends overlap into other fields.

"Like domestic relations. We now can extrapolate some very disturbing trends. You sociologists will see the same things soon, but you need a whole lot more data to reach a conclusion than we do. And the fact is that not only are more people assaulting and even killing their spouses than ever before, they're turning each other in to the police for crimes against other people. Children are doing the same thing. They're turning in their parents, their siblings, their playmates. They sometimes get really vicious about it. One of my colleagues said it reminded him of Nazi Germany.

"Uh—there's more: divorce statistics. We have an interest in them too, like the sociologists, but for different reasons. We need them to collate with our child abuse and spouse abuse cases, and our non-support cases and half a dozen other categories of crime. What these show us is that people who don't beat each other or murder each other still don't get along as well as they used to. It's almost as though people don't like people anymore.

"I talked to some of them as part of my studies, men and women. Again, we can see trends. To summarize, the typical male has reached the conclusion that all the women sell themselves, so they don't differentiate between the wife or the girlfriend and the prostitute. The women say 'why not, what else can we do with it?' Both sides claim the modern generation is too outspoken—both sides freely admit this is true but they just can't stand being hypocritical about it. One guy said to me, 'if somebody don't tell her her breath stinks it's gonna go on stinking forever.' It's pretty hard to equate that with old fashioned romance.

"In short, my conclusions are that unless we can determine what the trouble is and fix it, human beings will devolve into solitary creatures with occasional short liaisons that very seldomly will result in the birth of offspring. The men aren't going to stick around long enough to raise any and the women aren't likely to do it by themselves—and neither side is going to be very anxious to nurture the type of little ingrate today's child has become.

"Now, there are some other implications in this scenario that I haven't gone into in my oral report. They are in the process of composition and will be included in my part of the committee's first draft to the president. But because I haven't mentioned them or have mentioned them only casually, it doesn't mean that I don't think they're important.

"For instance, there are some special conclusions we can draw from the data that apply to the west coast, where conditions are worse, and likely always will be worse than in the civilized part of the country. Mr. Chairman, I yield the floor."

"Not a thing, Ed. It doesn't tell us

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a thing. Thirty-four hundred pages of small print and all it really says is they don't have the slightest idea of what this is all about. I especially dislike that Dr. Riddle's pun that—the truth hurts."

"He's right on the money with the rest of it, George. My department keeps records too. He's not out of line."

"What do you *really* think, Ed? Did somebody slip the United States a mickey?"

"I don't know, George. My agencies are following up new leads every day. Might as well; we can't just dump good agents in the unemployment lines, we've got to give them something useful to do until their pensions vest—don't need them for criminal investigations anymore, that's for sure."

The president nodded his agreement. "Who'da thunk it?"

Thunk it? "One of these days, George, maybe we'll get lucky, and one of my guys'll ask the right person the right question and we'll pick up the thread of the first infection—or whatever it was. Then the end may be in sight. With the computing power the modern nets can put together with these new programs, and the way they can crunch data these days, and with the motivation the people have, we might get a break. The average guy isn't very happy with the truth all the time, George. We're all getting tired of these one night stands. It'd be nice to have some stability in life—like you have. What *is* the difference between you and me, George? How do you and Barb manage to stand one another."

"Dunno, Ed. Habit, I guess."

The Attorney General rose to his feet. "Reminds me, George. I gotta go—gotta date. See you later." He flopped his hat loosely on his head and stepped into the elevator that always waited on the family level with its door open. With any decent kind of luck, if he kept at it, Ed figured statistics favored a match. Someday, he hoped he could wake up and look at his partner in the morning without throwing up and without her saying, "I think it would be nice if you left."

"Good night, Ed." The president waved goodbye.

Things had changed at *Epilogue*. After a brief fling with it, and with science fiction in general, Cande-Knoss, which had acquired it from Strasse und Schmidt, gave up and passed the torch to Avis. Avis chopped the words "Science Fiction" out of the title and added the magazine to its stable of low key technical magazines, such as their increasingly popular *Megabyte*, and *Prairie Home Computer*. John stayed on, of course, and he had enough clout in the publishing business to retain his old staff, including Kate. In an effort to fit Avis's more modern image he even junked his old Underwood manual.

But it's not the same, he groaned silently. *We've lost the magic. The sense of wonder is gone from the universe, or at least, from the Earth.*

One by one he slid the floppies from the case that Kate reloaded for him every morning, and slipped them into the drive of his new terminal, and read them, or parts of them, and made his comments electronically before shipping them back to Kate for transmission out on the net. Many he found interesting, some he even regarded as

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brilliant, and his technical education was good enough to tell the difference.

But it wasn't the same—not the job, not his relationship with Kate, and not his relationship with his family. Whatever plagued the country, or rather the world, since the effect had lately spread abroad, especially in the Asian Pacific and Western Europe, had chipped away the veneer of civility that had once protected the species. The trend was down.

Had it not been for the diehards that still wrote the old fashioned way, on paper, and the occasional yokel who lived too far out in the sticks to get the word that science fiction was dead, John would have had one less pleasure in life than he did.

But those jewelled treasures that still wandered in in dwindling supply represented a link with the past and a hope for the future, and he saved them and he cherished them and he shared them with Kate. Every afternoon, an hour before quitting time John switched off the terminal and put on his horn-rimmed reading glasses—and hoped.

Minutes ticked by, and hours. Another day lapsed into the throes of death. John reached out with a horny hand and carefully picked up a wobbly, doggy-eared stack of dingy paper strapped with a dozen equally ragged rubber bands, and dangling half a dozen more broken ones. *This one,* he muttered, *has been around.*

Most of the time a story that had trouble finding a home was not a very good story, but John kept an open mind and he gave such stories a fair test. He had to—he'd found too many gems by reading a little farther than the competition had—too many slow starters—too many shy, bashful people who left the zinger to the last page.

This wasn't quite one of them. He would have bounced it anyway, because there were too many other things wrong with it—the writing, for instance, was only fair, and the format was not industry standard—even if it hadn't been fiction thinly disguised as fact. Even so, in better times, John might have made an effort to encourage the guy, and using the old criteria and a little work the idea might have panned out, even in first person.

After all, it was speculative in a peculiar sort of way, and though the gimmick was old it certainly hadn't been overused. Embedding a subliminal message abjuring users to tell the truth was technically impossible, though probably just as illegal for computer programmers as it was for TV stations to do it. He liked the way the author explained how this had started out as his instrument of justice against a cheating employer, and how at first it appeared so insignificant and innocent that he didn't think of removing it from the production version until it was too late, or how bootleg copies eventually spread it all over the Earth. That was good development of the "if this goes on," theme. And certainly, there was as much evidence that this is what had brought humanity to his current sorry state as there was for any of the hypotheses the regular scientists were hawking.

John chuckled as he flipped the switch to turn on his terminal again. Here he was, putting his head in the lion's mouth.

He pulled his day's notes down, punched the dedicated key that took him

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to the end of test and typed—Dear Mr. Dover—that was a nice try. With a little more polish and the right subject you just might make the grade, even though I have to reject this one because we don't publish fiction. Good luck on future efforts.

He hit the return key a couple of times after that to give himself some room, changed fonts so she'd notice, and entered a note: Kate, we need this one on paper. Print it out and let me sign it personally. And, you might want to give this one a glance for old time's sake.

He archived and shut down for the second time that day. It was quitting time, and outside, the darkness of a winter evening was closing in on slushy city streets already jammed with rush hour traffic. John slipped on his coat and wrapped the long plaid woolen muffler around his neck.

As he stepped out of his office he could see that his watch had lied to him and it was already well past closing. Kate had already gone.

With a twinge of nostalgia he stepped back into the office, grasped the Dover manuscript and a big envelope to carry it in. She can't return it until tomorrow, he mumbled, and I need something to read on the train—like I used to. He tucked it under his arm and held on tight, and walked out the door into the chill wind, and tried to tell himself the wind had done it—that those weren't tears forming behind the horn rimmed lenses.

He struggled. He fought hard. He lost that one. But when he reached the station and boarded the train he made it through Dover's story once, for old time's sake. It was not the greatest story ever told, but it was all he had. ■

●It is from men who acted on nature and do not merely suffer to be acted upon by her, that history flows.

Salvador De Madariaga

●He needs to stand on tiptoes that hopes to touch the moon.

Thomas Fuller

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the reference library

By Tom Easton

Caliban Landing, Steven Popkes, Congdon & Weed, $16.95, 282 pp.
The Hex Witch of Seldom, Nancy Springer, Baen Books, $?, 276 pp.
Empire Dreams, Ian McDonald, Bantam, $3.50, 192 pp.
Desolation Road, Ian McDonald, Bantam, $3.95, 368 pp.
Memory Wire, Robert Charles Wilson, Bantam, $3.50, 224 pp.
The Crown Jewels, Walter Jon Williams, TOR, $3.50, 247 pp.
Ether Ore, H. C. Turk, TOR, $3.50, 282 pp.
Serpent's Egg, R. A. Lafferty, Morrigan Publications (84 Ivy Avenue, Southdown, Bath, Avon, BA2 1AN, England), £10.95, 166 pp.
The Tale That Wags the God, James Blish, Advent, $15.00, 290 pp.
Imprisoned in a Tesseract: The Life and Work of James Blish, David Ketterer, Kent State University Press, $29.50, xvi + 410 pp.
Science Fiction, Fantasy, & Horror: 1986, Charles N. Brown and William G. Contento, Locus Press (P. O. Box 13305, Oakland, CA 94661), $35.00, xiv + 347 pp.

I've long wanted to be a novelist, partly because writing novels seems to be difficult for me, and partly because the function is one I admire (partly because it *is* difficult for me). Nonfiction, including reviewing, comes more easily and therefore seems to me less worthy of admiration. (And, yes, I know someone else may feel quite differently.)

Part of my problem may simply be that I tend to think linearly, logically, not in the intuitive, tangled webs that seem to dominate much of modern fiction. On the other hand, linear fiction does still exist. Or perhaps I am too much the simplifier, which works in nonfiction and short fiction but not in novels, which require more complexity. Someday I'll get it figured out. For now, I'll get on with reviewing Steven Popkes's **Caliban Landing** (an "Isaac

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Asimov Presents . . .''), which is complicated and intuitive enough. The starship *Shenandoah* arrives at the world of Caliban. Its task is survey, seeking mineral wealth and *lebensraum*, and it is allowed to seek only on worlds that have been thoroughly checked against the possibility of native sentients. Naturally, since this is fiction, and Asimov's introductory essay is titled ''First Contact,'' we immediately know that someone goofed. Caliban has sentients, eyeless creatures that communicate by modulating the radio emissions of the local plants, and as soon as the humans meet them, they kill one. The death is accidental, but the humans know that they have damned themselves. Merely by being there, they have forfeited their ship, their careers, their futures. The death makes damnation more certain, unless they can induce the locals to forgive them.

The *Shenandoah*'s crew is captained by Megan, illegally hardwired into her ship; the bicentennial engineer, Bertini; the pilot, Sato; and the sensitive, Antonia, upon whom must rest the task of learning to communicate with the natives. Each has disasters in his or her past, and those disasters have much to do with infringements on the rights of others. Sato and Bertini have betrayed lovers, Megan a world of delicious aliens, Antonia a mother on a homeworld that itself betrayed its natives. Each brings pain and loss to Caliban, and each must somehow come to terms with the need for communication, for empathy, for forgiveness.

The humans prove unable to master the native's mode of communication. Fortunately, a Calibii, Binder, proves able to pervert her nature by learning to make the ''demons' '' mouth-noises. Binder was the first to see the humans, and the second to suffer, for it was her mate who died. Now her mate lives again, in a way, for he has been converted into an ''Ancestor'' within the trees that are essential to the Calibii's life cycle, and he craves revenge. And the several conflicts of loyalties and needs play themselves out.

Who has not stepped on others' toes? Who does not suffer the conflicts of needs and loyalties? Whose sanity and happiness do not require communication and empathy? Popkes's themes speak to us all, and he handles them well, so well that I find it hard to find anything negative to say. But there is always something: I have my doubts about the Calibii's communication method, so subject to the vagaries of cold and dark; evolution would surely favor, as it has on Earth, something more versatile (probably, in this context, self-generated radio, or even radar, perhaps with the aid of symbiotic plants). And then there is the *Shenandoah* itself: Popkes calls it a toroid very plainly, right at the top of page two, but the cover artist, Bob Walters, rendered it as a fat cigar. For shame.

I greatly enjoyed Nancy Springer's **The Hex Witch of Seldom.** Fantasy in the Appalachian mode has not yet been entirely overdone, though that time may come before long. It seems that ever since Manly Wade Wellman's death, writers have been moving onto the turf he had had virtually to himself. We can, perhaps, expect a territorial struggle, and then the emergence of one dominating ''Appalachian'' writer. Or else the turf will be destroyed in the struggle, beaten to death as so many other varieties of fiction have been before.

Springer's setting is the modern rural Pennsylvania landscape. Her heroine is Bobbi Yandro, a teenaged girl who lives with her Grandpap. Grandpap is a

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cranky old fellow, but he does love her, and when she requests a wild mustang for her birthday, he takes her to the government distribution center. There she is smitten by a horse no one else can handle. He is proud and intelligent, and she can almost see a handsome stranger staring out from behind the equine brow. His name, she decides, is Shane.

Would you be surprised if I said she was right? Shane is the Dark Rider of myth, Zorro, one of the mystic Twelve who command reality. He is he who walks alone and resists the taming of any woman's hand. Nor does he care for Grandpap's intent to geld him, and he is quite happy when Bobbi releases him from the stall in which he awaits the knife. And they are off, fleeing the helicopters, the state police cars, the all points bulletins for a little lost girl, or a runaway.

Fortunately, Shane knows where to take cover, with the titular witch, another of the Twelve. There Bobbi learns something of her own powers, and when she must move on, it is to move toward the maturity any teenager must seek—toward freedom from dependence, toward identity and competence, toward awakening sexuality. And if that last is never terribly explicit, it still informs the story deeply; it is embodied in the man-horse himself, in the hex witch's insistently phallic staff (which prefers to stand erect), even in the landscape of mountain and valley and climactic hump. Perhaps this is why the book is not labeled as one for "young adults"; it is, but the sexuality may be too pervasive for that market.

If the sexuality doesn't bother you, get this one. Read it yourself, and then give it to your 13 to 16-year-old daughter. She'll love it.

The stories in Ian McDonald's **Empire Dreams** are unfamiliar. I do not recall seeing them in the magazines or original anthologies or "Best's," and the galleys Bantam sent me do not reveal whether—or where—they might have appeared before. If they are not originals, then I suspect they must have appeared in England, for most of them share that flavor of literary costume-drama we associate with the realm of royalty, and the book's title does ring with the echoes of bygone days across the sea and around the world.

The stories themselves range from straight SF, as in the title story, in which a child is trapped in a cancer-killing fantasy, through fantasy and that branch of the mainstream called surrealism. "Radio Marrakech" is SF that borders on fantasy in its depiction of heightened perceptions. "Visits to Remarkable Cities" is pure morality-play fantasy. "The Island of the Dead" tells us that the briefly resurrected dead must lose their commonality with the living. "Vivaldi" says that the fate of the cosmos is essentially irrelevant to human life. "Unfinished Portrait of the King of Pain by Van Gogh" is a surrealistic interpretation of madness.

Is McDonald any good? "Scenes from a Shadowplay," a tale of decadent assassination, made me think of some strange hybrid of Vance and Wolfe. "Christian," the story of a boy and a mysterious kite-flyer who meet at the edge of the sea, added a thought of LeGuin. "King of Morning, Queen of Day," in which fairies, a strange comet, and a young girl's apparent madness all fail in their challenge to reality, strengthened my thought that here we have a writer who can swing his bat in the same league as any of the majors you wish to name. "The Catharine Wheel" confirmed this conclusion with its portrayal of a madwoman who moves

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into the computers that are terraforming Mars, and so becomes a goddess. He is not Wolfe, or LeGuin, or Wilhelm, or . . . He is their equivalent, a master for a new generation of SF.

Or is he? Simultaneously with McDonald's story collection, Bantam is publishing his first novel: **Desolation Road.** And while, chapter by chapter and scene by scene, McDonald's writing is as superb as in his shorter works, the whole fails to jell. Worse yet, he strives for humor, and though he is indeed often funny, skit by skit, the failure to jell reduces the novel to a too long string of schticks.

Desolation Road occurs on the same Mars as that of "The Catharine Wheel," when the terraforming has advanced enough to make the Red Planet relatively hospitable and Terran colonists have begun to put down their roots. A traveler, lead onward by a green-skinned time traveler, settles in a desert oasis. Others join him, dropped by destiny in the same oasis beside the railroad tracks, and the town of Desolation Road, uncharted, unknown by officialdom, begins to grow. But the Road's pioneers are human, and in due time they conflict. There is murder, and their children flee to become saints of Catharine and the centers of visionary sects, or the greatest snooker champs the cosmos has ever known, or ambitious politicians, or insanely violent revolutionaries, or titans of the crassest commerce.

The novel seems a parable of civilization, of the road from desolation to urbanity and then—McDonald calls it all too likely—back to desolation. The road is marked by strange bedfellows, ungrateful children, and collisions of environmentalists and industrialists, of politicians and terrorists, of mountebanks and charletans, and perhaps the events of any history seem no more—and no less—connected than those of McDonald's parable. Maybe history is indeed a string of schticks, studded with slapstick and interrupted by tragedy, linked by the actors and their kin.

But, dammit, that isn't enough to make the novel shine as brightly as McDonald's shorter works. Even a parable needs to be more pointed, and a novel needs a sharper focus. I hope he improves with time, for his skills hold the hope of wonders to come.

Robert Charles Wilson's first novel was the fine and moving and instructive *A Hidden Place*. Now he offers us **Memory Wire,** and we are quite naturally curious: Was he a flash in the literary pan? Or does he hold up? Best of all, does he improve with practice?

The answer is that best of all. Wilson remains an instructive writer, and his focus remains on character and emotion, but now he has written a more plausible tale, one so oriented to plot and action that, though it has some marvelous science fictional devisings, it is quite fittingly capped by its final line of *homage* to a famous exemplar of the spy-adventure genre.

The time is the next century. Population shifts have filled the coastal waters of California with "the Floats," slums built on pontoons and balsa rafts, threaded by filthy canals, inhabited by addicts of the ultimate neuropeptides. There, too, is the subculture built around the "oneiroliths," stones dug from the Amazon mud, multiplied by their ability to duplicate, crystal-like, in saturated solutions of mineral salts, and carrying visions for those who touch them. But the stones are more—they are artifacts of some ancient race of aliens, fractured pieces of a memory core left or lost on Earth. They contain all the knowledge

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of those aliens, and the governments of the world have found ways to tap the stones with their computers, and to draw off new technologies.

The problem is that the stones are old, and the ages have introduced errors past which the government researchers must struggle. But now less damaged stones are emerging, presumed pieces of the central core, their memories intact and strong. And the government forces are tightening up security. They want no smuggling of these prizes, neither to their enemies nor to the subculture.

Enter Wilson's characters: Ray Keller, a "Recording Angel," or human camcorder, his brain wired years ago to make him the perfect witness to the battlefield, now sporadically employed as a maker of exposé documentaries for the Network. Byron Ostler, the ex-Angel who had his wires yanked when he quit the Army and now works as a breeder and supplier of illicit stones. Teresa Rafael, ex-peptide addict, cured when Byron introduced her to the stones, now a stone-inspired artist. Byron loves her. She does not love him, though she is grateful. Perhaps she cannot love anyone, for her past includes terrors that have, perhaps irrevocably, damaged her self-worth.

Enter the mission: A guru of the stone subculture has gotten wind of the new stones and set up a buy. He needs couriers, and Byron, Teresa, and Ray are the ones. We track them to Brazil, through the buy, and watch things go sour. They are betrayed. Their supplier dies. They escape with the stone, and in the process Ray and Teresa fall in love, until the stone's visionary, memory-evoking powers drive them apart. The violent climax comes when a sociopathic government agent finally tracks them down, but it is nevertheless life-affirming, underlining Wilson's theme of memory as damnation, memory as redemption.

An excellent tale, and one that will surely be on the next round of Hugo and Nebula ballots.

Walter Jon Williams himself refuses to call his latest book, **The Crown Jewels,** a novel. It's a "divertimenti," says the list of credits.

So. Okay. Is it diverting? Consider: humans were once conquered by the relatively benign Khosali. Eventually, they rebelled and established their independence, but not before their culture had been deeply influenced by Khosali notions. One of the Khosali notions is that of High Custom, an aristocracy of awesome preciosity whose adherents strut for the delectation of the masses. Within High Custom is the institution of the Allowed Burglar, who can steal from the rich as long as he does it with style.

Now two empires coexist side by side, with Khosali among humans and humans among Khosali. And Drake Maijstral is an Allowed Burglar who has been commissioned to steal a small, ornamental box that is actually a cryogenic refrigerator for the semen of the last—and childless—Khosali emperor. Arrayed against him are the minions of the Khosali empire and of the human supremacists who would love nothing better than to see the empire's leading family die out. And whatever he does, he must do it with style.

The flavor is of the Ruritanian romance—complex machinations, preposterous premises, ridiculous characters, posturing heroes, bumbling action—that in due time gave us some of the tales

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of Wodehouse, and even the Three Stooges. There is even a hint of Charteris's Saint, especially in the name of a sidekick. If you remember these tales fondly, then, yes, the tale is diverting. If you remember them unfondly, it will drive you up the wall. If you don't know what I'm talking about, then go ahead, what the heck, and buy it. Its wackiness may well appeal to you, and you may enjoy Williams's satire on the *National Enquirer* view of the rich and famous.

I wish I could say that H. C. Turk's first novel, **Ether Ore** (a Ben Bova Discovery), was not a turkey. But, alas, the book is insistently, insufferably, unreadably cute and breathless and unlikely.

The premise: In some alternate universe, where Earth is Erth and Mars is Marz, there is a human society whose children earn their adulthood by working at the jobs that run civilization (adults have only hobbies). Melody Preece is one of these children, and more than anything else, she yearns to go to Marz, there to work at getting in the crop of plants that somehow (and chemically!) transmute atomic nuclei to create and concentrate a novel element which, once extracted from the plant and purified, provides the power for interplanetary travel. She succeeds, and once on Marz, she finds that the ether ore can also be purified to provide the essence of pure idea. Exposed to this essence, she becomes a ghost and shifts to another plane of the multiverse, where the essence is used in many ways—for instance, adding a little essence of the idea of "cooked" seems to be all one needs to do to prepare a roast.

Unfortunately for Melody, people who appear out of nowhere are regarded in her new universe as witches. She barely escapes being burned alive before falling into the hands of a government that would like to vivisect her, getting rescued by the rebels, surviving "concept bombs," and being recaptured by the government. Perils of Pauline stuff, all told in an endlessly irritating style rife with run-on sentences and peculiar orthography, and not saved at all by a plenitude of puns.

R. A. Lafferty, master of the ironic lie and the cockamamy sideways view of the world, also irritates, but with the significant difference that the reader always feels that he is saying something important. That something may hang elusively just beyond your mental grasp, but it *is* there. He tells you so, and then his characters tell you so, and finally, baffled by irrationally arbitrary plots, you tell yourself that it *has* to be there. Doesn't it? Nobody would publish this stuff if it were as meaningless as it looked, would they?

One wonders. But he has fans, some of them extremely enthusiastic, and he does keep getting published, even if largely by small, uncommercial presses these days. And, yes, he is indeed saying something: In **Serpent's Egg,** his theme is the way the world treats its geniuses. The time is fifty years hence, when the world is ruled by the Kangaroo Court, or just the Kangaroo. This body has removed some 87 percent of the world population by eliminating the

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dumb, poor, and rebellious, leaving only the bright, rich, and complacent. It has found ways to identify super-intelligence in animals, and in search of improvements for society, it sponsors Experiments, in which super-intelligent infants—of whatever species—are brought together and reared under watchful eyes. But it fears that some of these Experiments may wind up rocking the world-boat entirely too much, and when it spots such "serpent's eggs," it ruthlessly destroys them.

Serpent's Egg concerns one such Experiment. The kids are Lord Randal, a human, Axel, an Axel's Ape (these newly discovered primates have gargoyle faces and human skeletons; as the Second Humanity, they await awakening by God to take their full place on the world stage), and Inneal, an ambulatory computer. Inneal seems the most dangerous of the three, for she, enchanted by pirate stories, creates an ocean in the American Midwest in order to act out her fantasies and fully intends that her sea will cover all the world. Axel is also a threat to the world order because of what his kind represents.

Lord Randall seems innocuous enough, as do the nine other kids —unborn elephant, python, seal, bear, parrot, angel, wolverine, chimp, and a human girl—of the three other experiments the Kangaroo brings together with them. But the Kangaroo thinks otherwise. And as the twelve candidates for death reach their majority at age ten, the assassins prowl around them, appraising, plotting, and finally . . .

If you like Lafferty, you'll love *Serpent's Egg*.

* * *

Some of you will be delighted to hear that the late James Blish, noted SF critic, essayist, author of *A Case of Conscience*, the *Cities in Flight* series, *Black Easter*, and more, is back, twice over. **The Tale That Wags the God,** edited by Cy Chauvin, collects several of his essays, including one exercise in autobiography, and an interview conducted by Brian Aldiss. David Ketterer's **Imprisoned in a Tesseract: The Life and Work of James Blish** examines Blish's work with the eye of an academic critic fond of finding hidden meanings, subtleties, and interconnections.

I first read *Tale*, which pretends to be a successor to the two volumes of critical comment on SF that Blish published while alive, as William Atheling, Jr. When I later opened the Ketterer volume, I found myself seeing much for a second time, for Ketterer quotes repeatedly from the same essays that Chauvin collected for the former book, and he adds relatively little to Blish's own reminiscences. And when it comes to criticism, Ketterer suffers by comparison: he tries, but he lacks the wit, the bravura, the sparkle, of his subject, even though his interpretive efforts do throw some interesting light on Blish's fiction. Ketterer does put more emphasis on the essential compromises of the writer's life: Blish, trained in biology, spent years fighting the Surgeon General on behalf of the tobacco industry's PR arm, and then more years churning out Star Trek books. Sadly, it seems to have been his smoking (with a likely assist from alcohol) that killed Blish.

You, like me, may prefer Blish's own

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writings. Advent's price tag is half that of Kent State's, the book is shorter, and the package is far more readable. Ketterer's tome seems most suitable for those with a more academic interest in SF and Blish. Both have ample bibliographies.

Locus is a small magazine that bills itself as "the newspaper of the science fiction field," and it is. For two decades, Charles N. Brown and his staff have been doing an excellent job of covering the writers, the publishers, the fans, and the books that make SF what it is. The operation has been growing, too, for from *Locus* has sprung Locus Press, and from that comes occasional valuable reference works. The latest is **Science Fiction, Fantasy, & Horror: 1986,** by Charles N. Brown and William G. Contento.

SFFH: '86 is a bibliographic index to all the English-language SF&F, and horror, published in 1986. It lists separately novels, novelizations, juvenile/young adult works, omnibuses, collections, anthologies, magazines, reference works, art books, "associational" works (e.g., non-SF by or about SF people), and miscellaneous items (e.g., Tim Powers's *Night Moves*). It lists by author and by story title, presents the tables of contents of anthologies, collections, and magazine issues, and provides summaries of the book, magazine, and movie scenes. There are also a list of recommended readings, a depressingly long list of 1986 deaths, and two pages of small press addresses.

Oddly, though *SFFH: '86* does not overlook book reviews in the SF magazines (such as mine and Algis Budrys's), it does ignore "pure" reviewers, such as *Locus*'s own Debbie Notkin, Faren Miller, and Dan Chow. It also manages to miss most of Orson Scott Card's reviewing work. Note that this is not necessarily a failure: Brown and Contento were explicitly *not* covering *Locus* and other magazines that do not include fiction. But I cannot help feeling that the book would be more useful if the compilers had broadened their focus just a little to include more of the "associational" material. I am sure that many users of the volume would find it valuable to be able to look up not only what an author wrote, but whether and when *Locus* or the *SF Chronicle,* for instance, had had something to say about the fellow. The necrology could also benefit by noting the date and source of obituaries, if only those in *Locus*.

ANADEMS

Awhile ago I suggested that Gardner Dozois express his natural preference for stories from the magazine he edits by publishing a **Best of Isaac Asimov's Science Fiction Magazine.** Well, he's gone and done it, though he is far too prompt to be responding to what I said. It's from Ace, for $3.50, and contains seven stories from 1982 through 1985 in 258 pages. There are Gardner's own "The Peacemaker," Lucius Shepard's "The End of Life as We Know It," Connie Willis's "Fire Watch," Leigh Kennedy's "Her Furry Face," Greg Bear's "Hardfought," John Varley's "Press Enter," and Octavia Butler's "Bloodchild." Note that none of these

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stories were bought for the magazine by Gardner; most are from the period when Shawna McCarthy was the editor. Note also that there have been other, "regularly issued, non-theme *IAsfm* anthologies, . . . so that the Scitherian era . . . has been fairly well documented" (from the introduction). Perhaps there will be more, to document the "Dozoiscine" (Gardner's word, not mine) era. ■

IN TIMES TO COME

An Australian once asked me where I lived, and when I said, "New York—the state, not the city," she said it had never occurred to her that New York State and New York City weren't equivalent, like Washington and D.C. It's easy to make that kind of mistake about places that are very distant—or about a big place that you've spent your entire life deep inside. Probably most of us routinely hold a similar misconception of the Solar System, considering it equivalent to the nine major planets plus their satellites and the asteroids. In reality, there's vastly more to it than that, and eventually mankind is likely to spread into even the most remote and wildly different parts of it. To do so, human beings are likely to use every means at their disposal to adapt to new niches, including radical modification of their own body form. The resulting state of affairs may be something like the one in Charles Sheffield's new serial, *Proteus Unbound,* which starts in our August issue. It has the sweeping scope, wealth of imagination-tickling ideas, and well-twisted plot that you've come to expect of Sheffield, beginning with a far-flung humanity that uses shape-changing as a routine part of life—except that lately it hasn't been working as it should in some of the farthest-flung quarters. . . .

We'll also have the latest of J. Brian Clarke's "Expediter/Phuili" stories, plus others by W. R. Thompson, Joseph H. Delaney, Laurence M. Janifer, W. T. Quick, and Stephen L. Burns—plus a fact article on a very science-fictional-sounding way of life that's actually being tried out in an experiment now getting underway.

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brass tacks

Dear Dr. Schmidt,

Regarding your skeptical comments on H. Keith Henson's postscript following his letter on cryonics (November 1987), it's nanotechnology, not cell repair, that can open the solar system to human habitation. Eric Drexler expands on Gerard O'Neill's space colony ideas by showing how large habitats can be grown using asteroidal material and moved to Earth-like orbits with virtually no cost in human labor. Using 90% of the asteroid belt material for habitats, we could give four trillion people as much equivalent land space per person as we have on Earth now.

If worldwide life extension and concurrent large scale solar system colonization began in 70 years, 200,000 people will need to leave the Earth each day to "make room" for those choosing long life. This assumes that 20% of the 90 million people who would normally die in 2058 will still die due to accident, homicide, suicide, and by not choosing life extension.

Moving 200,000 people into orbit each day would require 140 shuttle flights (seven daily from each of 20 spaceports, for example) carrying 1,500 passengers each. Non-polluting solar or cold-fusion energy used for ground based laser powered propulsion systems are possible methods to achieve this.

The logistical problems are formidable, but they're not good reasons to fear long life. And, with or without long life spans, our birth rate MUST drop or our exponential growth will eventually use up every atom in the universe . . . just for human body mass.

HENRY LEDERER
3132 Hwy 101 S.
Wayzata, MN 55391

Dear Mr. Stiegler:

First, let me take a moment to thank

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you for sharing your perceptions, insights, and observations in "The Third Alternative." I thoroughly enjoyed the piece, and more than once was provoked to serious reflection.

I often wonder if there would have ever been a NASA, COMSTAT, or any of the myriad entities that now make up the aerospace industries, had it not been for forty or fifty years of writing efforts by the people like yourself, the creators of speculative fiction. It would be difficult for a person to choose a profession without having some expectation of what it was, or where that profession was going. Certainly, it played a significant part in my own professional involvement in technological forecasting, and social and economic engineering.

Outstanding speculative fiction, ("The Third Alternative") provides a glimpse into a new probability field of scenarios and expectations. To some, it will represent far more than mere entertainment, written to obtain so many cents per word. The full impact of the work may not be recognized for fifty years, and even then it may not be recognized at all.

Beyond the expansion of scenarios and expectations, "The Third Alternative" demonstrates that almost every reader, (indeed perhaps the entire society), may have the proper capabilities to attain these expectations.

In your future works, I shall be looking for instrumental steps that the reader might apply to attain the desired scenarios or expectation targets, and the monitoring framework necessary to determine if personal progress toward the expectations are actually being made. (Can a person be superrational if they lose their temper, become angry, and scream at their children?)

At DELPHI, our direction comes from a quote by Dr. Olaf Helmer, the originator of The Delphi Method. In an interview with *Omni* magazine he said, "The trick is not simply to forecast the future . . . but to intervene . . . and change the course of history." Our projects include, education via audiotext, computer mediated teleconferencing, and electronic academic journals. Please feel free to call upon us as a resource.

ROBERT J. SPANVILL

New York, NY

Dear Dr. Schmidt:

Re Marc Stiegler's novelette, "The Third Alternative," in your November issue. In an opening scene, the president of the United States, recently succeeded to the office on the death of her predecessor, is announcing for the first time her choice for a new vice-president. Then she is shot. We segue quickly to a TV newsman who, apparently several hours later, makes a reference to the acting-president, the same man chosen that afternoon by the president. There is just one thing wrong with this scenario: under the Constitution, as currently in force, it would be practically impossible.

The 25th Amendment to the Constitution, ratified in 1965, provides that the president's choice of a vice-president must be approved by both houses of congress. The procedure has been used twice, for Gerald Ford and Nelson Rockefeller. Both confirmations required lengthy hearings and full financial disclosure; Rockefeller's hearings were particularly contentious and involved.

While the office of vice-president was vacant on these occasions, the Presidential Succession Act of 1947 provided a presidential successor in the person of the Speaker of the House.

Now it is possible that, under some truly extraordinary circumstances, con-

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gress could assemble in a matter of hours and ratify the choice of a vice-president made by a president who was herself than the target of an assassination. But American politics and the Constitution just doesn't work like that. For one thing, until the official confirmation, the acting president would not have been the author's hero, but the Speaker of the House, described by the author as a rather weak-kneed individual unable to stand up to the Russians. Would this man willingly surrender an acting presidency that he had lawfully attained, or would he have delayed the necessary convening of congress? The author says nothing of the makeup of the congress that would vote on the choice of vice-president. He sounds like a man who would have his enemies, and even the potential of a Soviet plot would not necessarily move them to abandon their beliefs.

In short, it certainly would have been days, probably weeks, and perhaps months before this vice-presidential choice could be confirmed. The whole story thus would grind to a halt. If the Constitution has been streamlined in Stiegler's future to allow for a more rapid succession, the author should say so.

I don't consider this point a mere nit. You constantly urge your authors to speculate and extrapolate on the basis of the known, and to explain deviations therefrom. The same respect is owed to social and political institutions. They can't just be changed willy-nilly for an author's convenience without explanation. Stiegler obviously knows something about the Constitution, since he has his acting president say late in the story that the document bars acceptance of gifts on his part. I guess he just skipped over the parts on presidential succession.

Silver Spring, MD

The author replies. . . .

In response to the letter from Alan Clive, my main comment is: sigh. There is, alas, no sure answer to questions of what must, and what must not, be included in a story.

Alan has a good point when he says that only an extraordinary circumstance could inspire congress to ratify a choice of vice-president quickly. One of the few examples of rapid congressional movement was the declaration of war on Japan after the bombing of Pearl Harbor—*that* qualified as extraordinary enough. The question is, then, is the situation in the "The Third Alternative" also sufficiently extraordinary?

The answer is, "probably." The congress in "Alternative" had been, before the war, even more contentious and bureaucratic than any recent congress (if that can be imagined). However, the "Alternative" congress is not quite the same congress it had been a month earlier—it has become a war-born congress, recently bloodied in terrifying confrontation. The members of this born-again congress take their purpose seriously for the first time in their lives—a situation very similar to that of an earlier congress that woke one morning to the near-total destruction of our Pacific fleet.

Hilan Forstil certainly had enemies in congress, very powerful enemies—but again that was before the war. As noted in the story, Hilan had played an instrumental role in bringing the war to a victorious conclusion. Whereas he had been leader of a minority group of hawks earlier, now he is a bona fide hero, second only to Nell Carson herself as one who brought salvation. Everyone wants a place on his bandwagon. Meanwhile Avery Faulke, as a leader of the

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opposition that had been proven so wrong by the war, is out of favor. Add on top of this the possibility of a Soviet threat—the type of danger that Hilan is specifically famous for facing. Finally consider that in this unusual situation, congress is *not* choosing a vice president. *They are choosing a president!* Just that last point makes it an "extraordinary circumstance" all by itself.

The greatest threat to Hilan's ratification would be a filibuster in the senate, which could delay the process indefinitely. But house representative Faulke was not popular in the senate even before the war, where he is now virtually an Untouchable.

For all these reasons, I consider the events as described in the book as not only possible but probable. Nonetheless, it remains remarkable enough that the reader deserves some discussion if the issue is central to the point of the story.

Is it central to the story? In writing "The Third Alternative" I considered including this discussion and decided against it. Though it is a necessary incident to support the chain of events, it is secondary to the theme; once one grants that it is a possible sequence, it is even secondary to the plot. For at least some readers, such as Alan, my decision to excise this discussion was clearly an error. I hope they find the expansion here sufficient.

MARC STIEGLER

Dear Mr. Schmidt:

In regard to Lois McMaster Bujold's serialized story, *Falling Free*, I would like to say that the premise is excellent as well as original. However, her story has one major flaw.

Why waste money creating "specialized" humans when a robot could do the job better? Robots do not unionize. Robots do not require standard gravity or recycled air or fresh food. Robots don't talk back. They do exactly as they are programmed to do. Creating artificial environments necessary for human habitation would be prohibitively expensive. Consequently, deep space exploration and basic colony development should be done by machines—computers, robots and possibly androids. Preprogramming or remote control would allow the machines to carry out their duties.

Falling Free relies too much on shock and sensationalism. Recombinant genetic science is used primarily in the effort to cure or eradicate genetic diseases. It is not used to produce "user-friendly" freaks. No human being will probably ever be created intentionally different from the norm. It is inhumane and against basic human psychology to produce abnormalities. After all, most people are afraid of what is different. Radical disfigurement is a frightening concept to anyone. People with two heads? Consequently, genetic manipulation, at the most extreme, will undoubtedly be limited to animals. Any humans in need of an extra appendage, (secretaries for instance!), would no doubt make use of an articulated arm or other similar device.

All in all, Ms. Bujold reminds us that the human spirit is indomitable and that even people unfortunate enough to be "physically challenged" are human beings just like the rest of us. Ms. Bujold is obviously a compassionate writer. However, I think in order for this slave-breeding situation to actually occur, a mad, possibly physically deformed, dictator would have to rule Habitat, keeping its existence completely secret. A benevolent society would not allow the production of human slaves. Even the United States, once it recognized black

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people as "humans," forced the southern states at the end of the Civil War to release its slaves.

I do hope *Analog* will continue to publish new writers and stories with the "human condition" as a major factor. Stories about real people, not furry aliens, dealing with the problems and situations of outerspace are always most interesting.

CONNIE CASTRO

River Edge, NJ

The author replies. . . .

With regard to Ms. Castro's major point, I think she will find as she reads on in the story (as I hope she will) that we are not in profound disagreement. It would take a very special set of circumstances to make creating "specialized" humans an economically viable proposition. And in fact, GalacTech doesn't so succeed; the Cay Project ends in expensive failure. But special isn't impossible. I hope to explore more variations on this theme as I develop my "Aliens-R-Us" future in further works.

My machines are probably underdeveloped. I believe Gregory Benford has done something quite radical on machine evolution recently. But that's his story, not mine. The "machines are more efficient for space exploration" argument leaves out the primary emotional fact that it's *we* who want to go. If we didn't, sending the machines would be pointless in the first place. In human affairs reason tends to be retroactive.

Alternatively, she may be overestimating the capacities of robots. Robots operate from a preprogrammed menu of choices—they cannot produce a creative response to an absolutely novel situation unforeseen by their programmer. It is exactly in situations of exploration and development that machines cannot replace men. Also, that a certain technical endeavor is expensive, dangerous, and counterproductive does not mean that humans won't do it anyway. I might cite our nuclear arsenal as an all-too-real case in point.

I agree that recombinant genetic science will start out as a medical effort, and extreme genetic manipulation will begin with animals. But I see no reason for it to stop there, particularly as the price drops. Even in our present culture, right now, recombinant genetics is used to make a profit. Besides designer genes whose purposes are driven by hobby or fashion rather than need, there's always the military applications. All technologies get abused sooner or later, given time, the human imagination, and historical circumstance. The flaw is not in the technology.

One vitally important point Ms. Castro seems to be missing, however, is that the quaddies are neither disfigured nor freaks, despite Leo's first and Van Atta's lasting impressions of them. They are finely adapted and therefore beautiful, not abnormal, in their setting. Let us not get carried away with this preemptive genetic bigotry or somatic prejudice. Genetic engineering can present opportunity for delightful variations on the human theme, a richer and more varied universe, creative good mixed with evil as ever, not to mention accelerated evolution. This is the ultimate assertion of the book. If I've done my job right, by the end of it legs should start to look strange to you. The quaddies' creator Dr. Cay was in a sense a dictator; the Habitat clearly kept a low profile. But Cay was an artist, not a madman. I wish I could have done more with him in the book, but posthumous character development is tricky. Alas that his creation fell, after his death, into the hands of lesser men.

A benevolent society might not allow

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the production of human slaves, but not all societies are benevolent, nor are generally benevolent societies good all the time, particularly during times of stress, war, or economic collapse. Improved technology had as much to do with the destruction of the institution of slavery as improved morality. And slavery's not that long gone, either. It was still legal in Saudi Arabia as late as the 1920s, according to Col. Lawrence's memoirs; and then there were the massive slave labor camps of World War II.

These are all live issues, not cut and dried, which is of course why they appealed to me for my story. I look forward to more debate.

LOIS MCMASTER BUJOLD

Dear Stanley,

I am afraid that my friend Harry Stine was quite wrong in his statement (Mid-December 1987) that "Nuclear explosives are extremely difficult to initiate." Would that it were so!

"With modern weapons grade uranium . . . terrorists would have a good chance of setting off high yield explosions simply by dropping one half of the material on to the other half. Most people seem unaware that if separated U^{235} is in hand, it's a trivial job to set off a nuclear explosion, whereas if only Plutonium is available, making it explode is the most difficult technical job I know. . . . Given a supply of U^{235} however, even a high school kid could make a bomb in short order."

My authority? Only the man who designed the implosion mechanism of the Trinity and Hiroshima bombs. I'm quoting from Luis W. Alvarez's fascinating autobiography "Alvarez: Adventures of a Physicist" (Basic Books; 1987).

ARTHUR C. CLARKE

Dear Mr. Schmidt:

I read with interest your editorial in the mid-December issue of *Analog*. Although your main point is quite correct, your treatment of the issues involved seems to me to suffer from two confusions. Initially, you seem to be assuming that "You're entitled to your opinion," is a defining property of opinions and that it means something like "All opinions are equal." I take it that this is the basis of your claim that you have been unable to find a genuine matter of opinion except in the case of a blind guess. That this is surely wrong is shown by the fact that you later claim, quite correctly, that some opinions are better than others. If the latter claim is true, then the question involved must, in some fairly straightforward sense, be a matter of opinion, though it does not follow from that either that all opinions on the question are equally good, nor that no one knows the answer.

The second confusion involves what I take to be your implicit assumption that your categories are exclusive and that no statement (it is clearer to talk about statements here than to talk as if facts, opinions, and tastes were all some sort of quasi-physical object) can be in more than one category. "The Earth is spheroidal," expresses my belief about the shape of the Earth and, thus, expresses my opinion. (Defining an opinion as a belief that is not known to be true is appropriate only if one insists on making all opinions equal.) It also expresses a fact.

Your statement #9 belongs in all three categories. It also belongs in a category with #7 and #8, since all three are value judgments. Number 10 is certainly *about* tastes, but it also belongs in the fact category, since it would ordinarily be understood as implicitly containing some sort of "in most cases" qualification. (Indeed, to be true, your

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#1 must be understood in just such a way, since it is not true of live birds or helium balloons.)

Number 11 is not a statement of taste in any acceptable sense of that term. It is in *your* sense of the term, of course, but your sense is *vastly* (and dangerously) broader than common usage would permit. Consider the statement "If an unsupported person falls freely from 500 feet onto bare pavement, he will be injured." (If you insist on "a specific person," substitute "I.") That is a statement of fact, but it clearly is a fact about a person's relationship or interaction with an external object. Further, *every* observation is a report of the result of just such an interaction between the observer and the external world.

I describe your definition as "dangerous" because you, and most other people, mistakenly believe that tastes cannot be the subject of rational dispute, and your definition would put almost everything into that category and thereby invalidate the whole point of your essay. In fact, "taste" is used in two quite different ways. There is an objective sense which is intended when, e.g., we describe someone as having good taste with respect to something or other (clothes, cheese, wine, etc.), and in this use such statements are really value judgments. The other sense is subjective and involves reports of what might be described as purely personal preference. The distinction between the two is that one can (or at least should be able to) offer reasons in defense of objective taste claims but can at most only offer explanations for subjective ones. I may be able to explain my preference for a particular kind of candy bar by pointing out that I like the contrast in texture between the peanuts and the caramel, but that would not be a reason for others to prefer my bar nor would it show that someone with a different preference was mistaken. At some point, subjective reports can be accounted for only by saying something like "I don't know why I prefer it; I just do."

An objective judgment, such as your #9, however, concerns subjective tastes only in the sense that most people who know about *and enjoy* such things would have a personal preference that agreed with the objective claim, but this need not be true for any given individual. I can correctly distinguish good cheese from poor even though my personal preference is for cheese (processed) that barely deserves the name.

A person who claims that *Finian's Rainbow* was the best musical of 1947 represents himself as being knowledgeable in such matters and as having reasons for his view. If he does not have reasons (plot, staging, score, etc.), he will be forced to retreat to: "Well, I liked it, anyway," or some such. It is easy to confuse the two senses because people have a strong tendency to *misuse* such statements by making them when they are only entitled to express a personal preference. They do this *just because* objective claims demand attention and respect, while subjective claims do not. If you prefer that musical to any other, that fact alone gives me no reason to want to see or listen to it, because I don't know how good your taste is in such matters. (I assume, of course, that it is excellent; but I don't actually know that.) "I don't know anything about art, but I know what I like," is the mark of a boor because only a boor would believe that ignorance of art would mean that one's preferences should be taken seriously. In fact, if he doesn't know about art, no one has any reason to care what he likes, and respecting his opinion would almost certainly be a mistake.

Finally, (I trust you are happy to see

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that word) the distinction between fact and opinion seems to me to be this: Something is described as "a matter of opinion" if the speaker is prepared to assume that reasonable men may differ as to the truth of the claim being made. (It *is* a matter of opinion only if the speaker is right about that.) He need not assume that *any* belief on the matter is acceptable, of course. When only an unreasonable person would differ, the claim achieves the status of a fact. It is an opinion as well, but it isn't described in that way because that would leave open the possibility, though it would not strictly imply, that the reasons in support of the claim are not conclusive. Calling it a fact tells one more than calling it an opinion would. In short, if I am right about all this, your definition of "fact" is too stringent—there is surely something wrong with calling the sphericity of the Earth "highly probable"—and your definition of "opinion" too restrictive—since it does not permit an opinion to be well-founded.

REESE P. MILLER

Ontario, Canada

P.S. The best thing on matters of taste that I know of is J. O. Urmson's "On Grading." It may be found in *Logic and Language, Second Series*, edited by Anthony Flew. It is very perceptive and very readable, although you will have to assess the worth of that value judgment yourself.

I am frankly baffled as to where you got the idea that anything in the editorial "does not permit an opinion to be well-founded"; one of its central points was that some opinions—those which come very close to matching objective facts—are much better founded than others. As for my definition of fact *being too stringent, I point out that an important part of learning to be a scientist is learning that all theories deal with* models. *Some models may fit reality very closely, but it is dangerous to fall into the trap of believing your models* are *reality, no matter how tempting that belief may become.*

I am equally baffled by your contention that my definition of "taste" would "put almost everything in that category." No, no, NO! *The whole point was that some things belong in that category and others don't, and a lot of confusion comes from failing to distinguish which is which.*

I specifically reject your contention that the Finian's Rainbow *statement is "an objective claim." You are, of course, free to define your terms in any special way for the duration of a discussion, just as a mathematician can let* x *equal anything he likes in a particular problem. You could, for example, define a set of measurable criteria for judging the quality of a play or story (though you haven't done so here), but nobody has yet come up with a way to do that which consistently matches whether any particular viewer or reader* likes *it. If you accept my basic premise that that is the* raison d'être *of a play or story (and evidently you don't, though you haven't told me what you do accept instead), then that is all that really matters; and an objective standard of "good taste" is a not-so-innocent fiction foisted off by self-styled critics on playgoers, readers, and cheese-nibblers too willingly brainwashed into acceptance of "authority."* ■

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a calendar of analog upcoming events

30 June-3 July
Science Fiction Research Association 19th Annual Conference (academic SF conference) at Hershey Hotel, Corpus Christi, Texas. Info: David G. Mead, Conference Chair, College of Arts and Humanities, Corpus Christi State University, 6300 Ocean Drive, Corpus Christi TX 78412.

1-3July
WESTERCON 41 (western North America SF conference) at Hyatt Regency, Phoenix, Ariz. Guest of Honor—Robert Silverberg, Fan Guest of Honor—Craig Miller. Registration—$45 through 15 June, $15 supporting. Info: Westercon 41, Box 26665, Tempe AZ 85282. (602) 839-2543.

8-10 July
LIBERTYCON 2 (Tennessee SF conference) at Sheraton City Center, Chattanooga, Tenn. Guest of Honor—Gordon R. Dickson, Artist Guests of Honor—Ron and Val Lakey Lindahn, MC—Wilson "Bob" Tucker. Registration—$18 until 1 June, $25 thereafter. Membership limited to 650. Info: LibertyCon 2, Box 695, Hixson TN 37343.

15-17 July
The First Annual Traveling Fete (Florida relaxacon) at Cocoa Beach, Fla. Guest of Honor—Joseph Green. Registration—$15 until 1 July (includes guided tour of Space Center). Info: SFSFS Treasurer, 4427 Royal Palm Avenue, Miami Beach FL 33140.

23-25 July
NECON VII (Rhode Island and Providence Plantations Sf conference) at Roger Williams College, Bristol, R.I. Guests of Honor—John Farris, F. Paul Wilson, Artist Guests of Honor—Charles Lang and Wendy Snow-Lang, TM—Stanley Wiater. Info: NECon VII, Box 3251, Darlington Branch, Pawtucket RI 02861.

29-31 July
ECUMENICON (Mysticism, magic, etc.) at Quality Inn, Arlington, Va. Featured speakers—Jacqueline Lichtenberg and Jane Sibley. Registration—$35 in advance, $45 at the door. Info: Ecumenicon, c/o Lee, 401 M Street NW, Washington, D.C. 20001. (301) 445-0388.

29 July-1 August
MAPLECON 10 (Ottawa SF conference) at Carleton Tour and Conference Centre, Ottawa, Ont. Guest of Honour—George R.R. Martin, Artist Guest of Honour—Don Maitz, Fan Guest of Honour—Michael Wallis, Comics Guest of Honour—John Romita, Jr., Star Trek Author—Diane Carey, Special Guest of Honour—Hal Clement. Registration—$20 until 30 June, $25 thereafter. Info: Box 3156, Stn. D, Ottawa, Ontario K1P 6H7 CANADA

1-5 September 1988
NOLACON II (46th World Science Fiction Convention) at Sheraton Hotel & Towers, Marriott Hotel, Rivergate Convention Center, New Orleans, La. Guest of Honor—Donald A. Wollheim, Fan Guest of Honor—Roger Sims TM—Mike Resnick. Registration—$70 to 10 July, more at the door, Supporting—$30. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition, the works. Join now and get to nominate and vote for the Hugo awards and the John W. Campbell Award for Best New Writer. Info: Nolacon II, 921 Canal Street #831, New Orleans LA 70112 (504) 525-6008.

—Anthony Lewis

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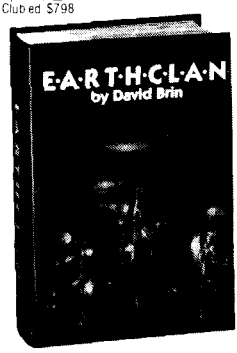

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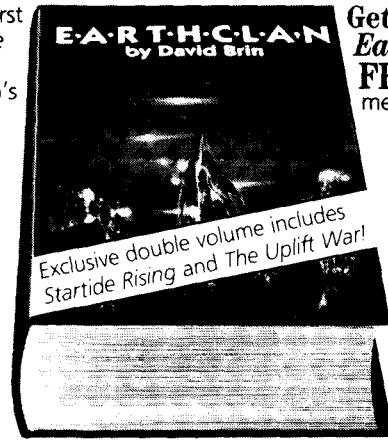

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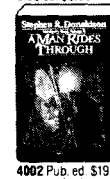

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